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FOREST SERVICE

INSTRUCTIONS

FOR

THE SCALING AND MEASUREMENT OF NATIONAL FOREST TIMBER

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U. S. DEPARTMENT OF AGRICULTURE,

FOREST SERVICE.

HENRY S. GRAVES, FORESTER.

INSTRUCTIONS

FOR

THE SCALING AND MEASUREMENT OF NATIONAL FOREST TIMBER.

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THE SCALING AND MEASUREMENT OF NATIONAL FOREST TIMBER.

The following instructions govern the scaling and measurement of National Forest timber. They supplement the National Forest Manual and will be followed in the administration of timber sales, timber settlements, timber trespass, free use, and administrative use. Uniform standards and methods are necessary in all National Forest work involving the measurement of timber. It is therefore essential that these instructions be carried out strictly by all Forest officers.

Unless timber is sold on an estimate in the tree, it must be scaled, counted, or measured before it is removed from the cutting area or from the place designated for scaling.

Regulation on Scaling.

The regulation of the Secretary of Agriculture on scaling National Forest timber is as follows:

REG. S–18. No timber cut under any contract shall be removed from the place designated until it has been scaled, measured, or counted and stamped by a forest officer, unless such removal is specifically authorized in the agreement.

No person except a forest officer shall stamp any timber belonging to the United States upon a National Forest with the regulation marking ax or any instrument having a similar design.

The cubic volume rule and the Scribner Decimal C log rule, both as used by the Forest Service, are the official rules for scaling National Forest timber.

Use of Customary Commercial Units.

National Forest timber will ordinarily be appraised, sold, and measured by the customary commercial units. As the standard practice, saw timber will be scaled by the thousand board feet log scale, railroad ties by the piece of stated maximum and minimum size, mining timbers by the piece or linear foot, telephone poles by the piece of stated length and diameter class, piling by the linear

foot, and fuel, shingle bolts, and pulpwood by the cord or its equivalent in solid cubic feet. Other units may be used for these products however, when better adapted to local trade customs.

SCALING LOGS.

POLICY.

Scale of Timber in the Log.

Scaling, as practiced by the Forest Service, is the measurement of sound material in the log and relates to quantity rather than quality of material. Timber will therefore be scaled in accordance with the defect in the log and not in relation to any particular grades of lumber it will produce.

Scaling sound contents in the log rather than material of certain lumber grades is the standard practice of the Service for the following reasons:

(1) The unit of measure is regarded as more stable, with less fluctuation from year to year, than where lumber grades are followed. Greater certainty is thus assured purchasers as to what material they will be required to pay for throughout the life of their contracts.

(2) The basis of scaling is less subject to individual judgment. It is more readily learned by scalers and more uniformly applied, and hence is more practicable as a common standard for a large number of scalers in timber of varying size and quality.

(3) Mill tallies are not required for effective application of the scale or to settle complaints by purchasers. The obligation to check the scale by mill studies, which is implied in scaling to certain lumber grades, is avoided. The accuracy of the scale is directly and inexpensively determined by a check on the logs themselves.

Use of Mill Checks.

At the same time, proficient scaling requires a knowledge of how timber "cuts out." The best way to train the judgment and instruct scalers in making deductions for particular kinds of defect is to see how defective logs open up in the mill and the actual loss as compared with sound logs of the same size. The check made by a scaler at the mill should be on the amount of defect shown in the lumber as

against his estimated allowance for defect, and should not be based on the mill tally of lumber. Frequent mill checks are therefore desirable, not to correct the previous scale, but to train the scaler's judgment in making allowance for various classes of defect.

In training and instructing scalers, check scaling, settling complaints, discussing proposed sales, and other matters of scaling practice, scaling to include certain grades of lumber and exclude other grades will be avoided as far as practicable.

Defects and Methods of Deduction for Them.

Log defects include crooks and any defective or waste material which will actually reduce the yield of lumber from the log. The most common forms of defect which affect the yield of lumber are rot, shake, check, cat face, and wormholes. Defects such as sound knots and discoloration, affecting the quality and not the actual yield of lumber produced, will not be recognized in scaling.

In Forest Service scaling deductions will not be made for defects outside of the right cylinder (a cylinder whose sides are at right angles to the top and base) represented by the top end and total length of the log, or for defects in the portion of the log which will be slabbed off. Material secured outside the cylinder is part of the overrun and is taken into account together with overrun from other sources in fixing the price of the timber. For this reason overrun should not affect the scale in any manner or influence the scaler in making deductions.

Otherwise deductions will be made for all visible defects which will actually reduce the yield of lumber from the log. There must, however, be an unmistakable surface indication of the defect. The scale should never be reduced simply because the timber is known to be more or less defective, or because hidden defect frequently appears in sawing.

In applying the foregoing the loss will be those portions of the boards from the cylinder which must be trimmed off because of the defect, provided that the remainder of each board has at least the minimum length manufactured from the species in standard milling practice in the region and is at least 4 inches wide. If the remainder of any board is shorter or narrower than these limits, the entire board will be considered lost.

The methods of manufacture of particular purchasers will not be taken into account by scalers. No attempt should be made to adjust the scale to losses due to poor equipment or inefficient methods, or to catch up gains from exceptionally close utilization. It is the scaler's function to determine the amount of sound material in the log as uniformly as possible, whatever the mill tally secured may be.

Mill Overrun.

In making mill checks or more extensive "mill studies," it is of course desirable to compare the total cut of all merchantable grades of lumber with the log scale under the standard Service method; thus determining the overrun.

Mill overrun is made up of:

(1) Any saving in saw kerf under one-fourth inch, the kerf upon which the scale rule is based.

(2) The saving in kerf from cutting dimension stock, timbers, and other material over an inch thick.

(3) Trade practice in cutting lumber of scant thickness.

(4) Utilization of narrow widths in slabbing, not included in the diagrams upon which the Scribner scale is based.

(5) Utilization of short lengths from the swell of logs, not included in the Scribner diagrams.

(6) Utilization of lumber grades which admit considerable unsound material, rot, broken-down sap, etc., which should be eliminated in the scale.

The first five sources of overrun are obtained from all classes of logs, sound as well as defective. The normal overrun from these sources under the Scribner log scale ranges from 4 to 20 per cent, depending upon the size and taper of the timber. This overrun should be secured under Service scaling in sound timber. In defective timber it should be obtained in the grades of lumber admitting sound defects—such as sound knots, firm red rot, etc.—for which no deductions are made in the scale.

Since the scale deducts for all unsound defects visible in the log, except those outside of a cylinder represented by the top end and length and those which will be slabbed off in milling, lumber grades containing considerable amounts of such defect, if such

lumber is manufactured, should under accurate scaling be largely overrun. Good scaling under the Service standard should thus yield an overrun equivalent to the greater part of the cut of grades which contain considerable quantities of unsound defect in addition to the normal overrun on sound logs.

Assurances to Purchasers.

No assurances regarding the Forest Service scale should be made to purchasers, except that—

(1) The Service will give them a scale of the sound material in the log under the Scribner Decimal C rule. The Service practice of reading diameters to the nearest, instead of the next lower, inch should be made clear, together with the requirements governing maximum scaling length, trimming allowance, and penalty for overrunning the trimming allowance.

(2) The Service will make systematic checks on the local scale by more experienced scalers of special competency.

(3) The Service will make special check scales by the best men in its organization in case of serious complaint.

Where mill-scale studies have been made, prospective purchasers may be furnished with the results of the Service scale in given classes of timber as to species, size, soundness, etc., and under specified manufacturing methods. The furnishing of such information should, however, convey no direct or implied guaranty whatsoever on the overrun in a proposed scale.

Assurances to purchasers should be restricted absolutely to those given above. *Never should any assurances or promises be made on amount of overrun.*

Definition of Merchantable Logs.

Every timber-sale agreement should define exactly the material to be classed as merchantable under its terms. Exceptions to this rule may be made only in rangers' sales where satisfactory standards of utilization have been established. In sales of sawlogs this definition will consist of:

(1) The minimum length of merchantable logs.

(2) The minimum diameter at small end.

(3) A minimum percentage of the gross scale of the log remaining after deductions for defect. (See merchantability clause, Form 202, Timber Sale Agreement.)

And, where desirable:

(4) The minimum length and width of material in any log which will be considered merchantable.

As rapidly as practicable, standard percentages under No. 3 will be established for each species in each region. These will ordinarily be applied uniformly in sawlog sales. They should be not more than 33⅓ per cent of the gross scale of logs of the more valuable commercial species, and not more than 50 per cent of the gross scale of logs of inferior species.

As rapidly as the necessary data are obtained from mill studies or other thorough investigations, the standard definition of merchantable logs may include a specific statement of the treatment in Service scaling of common defects or alleged defects in the timber of the region. This makes the work of different scalers more uniform and the Service standard more stable. It is particularly desirable to indicate that no deductions will be made for defects, like firm red stain and firm blue stain in Idaho white pine, which mill studies have shown convincingly do not affect the cut of sound lumber.

Designation of Places for Scaling.

Unless specified in the contract, the places where timber is to be scaled will be designated by the officer in charge of the sale. Such places should be adapted, as far as reasonable economy in scaling will permit, to the practical requirements and methods of operation, so as to impose as little additional cost upon the operator as possible. Scaling will not be done, however, in places or under conditions dangerous to life or limb.

Frequency of Scaling.

In small sales the frequency of scaling must be adapted to the reasonable requirements of the purchaser. It is desirable to scale only at intervals within which considerable quantities of timber are logged and assembled, such as 15,000 or 20,000 feet. Any such measures to promote economy must, however, be enforced only as far as it is practicable for the purchaser to comply with them.

In larger sales the most economical plan of scaling should be considered in advance and provided for in the agreement. (See Standard Clauses 29, 30, 31, National Forest Manual.) Clause 31 should be generally used in sales where operations will be conducted simultaneously over a considerable area.

Requirements of Purchasers.

The bunching or skidding of logs is usually unnecessary for efficient or economical scaling. Where necessary, however, for this purpose, purchasers may be required to assemble and hold logs for scaling in the manner prescribed by the forest officer. This should be covered by a specific clause in the contract. On the other hand, methods of scaling should, so far as practicable, be adapted to the operating methods of the purchaser. (See Standard Clauses 29, 30, and 32 of the National Forest Manual.)

If cutting is to be done on Government and private lands simultaneously, the purchaser should be required to keep the logs separate up to the point of scaling. (See Standard Clause 33, National Forest Manual.)

The Log Rule.

All saw timber will be scaled by the Scribner Decimal C log rule or measured by the cubic foot. The Scribner Decimal C log rule drops the units and gives the contents of a log to the nearest 10 board feet. One cipher added to the sum of the numbers read from the scale stick gives the total scale of the log, except in the case of 6-inch logs 6, 7, 8, and 9 feet long and 7-inch logs 6 feet long. The reading for these is 0.5, which multiplied by 10 gives 5 feet as the actual scale.

Scale sticks for logs of even lengths are furnished in 30, 36, 48, 60, and 72 inch lengths. Scale sticks showing odd lengths will be furnished whenever the demand is sufficient to warrant their use.

In the absence of a scale stick, or where the position of logs in the pile makes its use difficult, their diameters and lengths may be tallied and the scale figured from a table later, fair allowance being made for defect.

Table 1 on pages 42 to 47 of the Appendix gives the contents of logs of both odd and even lengths of 6 to 32 feet and of diameters of 6 to 120 inches. One cipher must be added as with the scale stick.

Log Lengths.

On all National Forests, except those in Alaska and west of the summit of the Cascade Mountains in Washington and Oregon, logs over 16 feet in length will be scaled as two or more logs, as far as practicable, in lengths of not less than 12 feet. Exception to this requirement is also made for 17 and 18 foot mining timbers on the Black Hills Forest which will be scaled as one log. The diameters of other than the top length should be increased in accordance with the taper of the stick. For example, a 42-foot log 16 inches in diameter would be scaled as:

One 12-foot log with a diameter of 16 inches.
One 14-foot log with a diameter of 17 inches.
One 16-foot log with a diameter of 19 inches.

Logs should be divided into even lengths as nearly as practicable. Where the division is unequal the longer log should be scaled as the butt log.

Taper Tables 9 and 10 on pages 69, 70, and 71 of the Appendix are to be used simply as a guide, the allowances for taper being varied to conform to the actual taper.

On the National Forests in Alaska and west of the summit of the Cascade Mountains in Washington and Oregon, logs up to and including 32 feet in length will be scaled as one log; lengths from 34 to 64 feet, inclusive, will be scaled as two logs as nearly equal in length as possible in even feet. Greater lengths than 64 feet will be scaled as three logs, making the divisions as nearly equal as possible in even feet, and increasing the diameters according to the taper of the log.

When logs are scaled as two or more logs the scale allowed for the separate lengths will be added and the total recorded as one log.

The use of logs of odd lengths by purchasers should be encouraged.

Table 1 includes the scale for logs of odd length. Scale rules for odd lengths may be had upon requisition.

Allowances for Trimming.

The scaling length clause of Form 202 specifies a definite allowance for trimming. This allowance should be adapted to different logging conditions and to large and small timber. Three inches overrun will ordinarily be sufficient for small timber where the

danger of brooming is slight; while 6 inches may be reasonable in sales of large timber or where the danger of brooming in driving or chuting is great.

MEASURING, NUMBERING, AND STAMPING LOGS.

Measuring Log Lengths.

The length of all logs about which there is any question in the mind of the scaler will be measured. In addition, the length of logs in the general run will be measured frequently enough, preferably directly after the sawyers, to make sure that the specified trimming allowance is not exceeded and that the proper variation of log lengths to obtain the best utilization is followed. Any logs overrunning the trimming allowance will be scaled to the next foot in length, as outlined under "Penalty scale," page 25.

Frequent measuring is of special importance in small sales where a scaler is not always present, since sawyers are more apt to be lax than when the lengths are checked daily by a forest officer.

Measuring Diameters.

All diameters will be measured inside the bark at the top end of the log. Diameters will be rounded off to the nearest inch above or below the actual diameter. Logs which have a diameter exactly half way between inches will be thrown to the next lower inch.

If logs are not round, they will be scaled on the average diameter. Several diameters may be measured where necessary to obtain a fair average. The average thus obtained represents in effect the top diameter of the log, and should be so treated in scaling. For example, if two measurements taken are 33 and 38 inches, the average diameter is 35½ inches and the log is scaled as a 35-inch log. The practice of alternately using the higher and lower diameters in logs with tops of irregular diameters will not be followed. When at the scaling end of a log there is a swelling from which no lumber can be cut, the necessary reduction in diameter will be made.

Numbering Logs.

Every log, whether merchantable or cull, must be numbered with crayon at the time it is scaled, except under circumstances which in

the opinion of the district forester will permit no subsequent use of the numbers, in which case a specific waiver of the requirement will be made by him. Whether the numbering is to be done directly before or after the log is measured is discretionary with the district forester. The scale of the log will be entered opposite its number in the scale book, or the letter O in the case of cull logs. (See page 36 for method of recording amount of cull in scale book.)

This feature of Service scaling is essential and must be followed for the following reasons:

(1) It is a check on the total number of pieces scaled.

(2) It fixes the responsibility of the scaler for his scale by individual logs. It is thus a safeguard against lax scaling.

(3) It permits an exact check on the scale at any time. This is desirable, even where logs are manufactured immediately, to enable the supervisor, check scaler, or inspector to make an absolute check whenever the sale is visited, if only on half a dozen logs.

(4) It affords an equally definite basis for the settlement of complaints, and is thus a protection to purchasers.

The numbering of cull as well as merchantable logs is desirable both to check the total number of pieces scaled and to fix the responsibility of the scaler. The latter is as essential in the matter of culling logs as in making an accurate scale of merchantable logs. Unless required by the district forester in ascertaining the cull per cent on sale areas or for some other reason the numbering and recording of cull logs not brought to the point of scaling will not be necessary.

Scale Book Letters.

In sales which require the use of more than one scale book, the books should be lettered serially with the letters of the alphabet, in the order in which they are used. In order to avoid confusion in recording the scale of logs in several small sales to the same purchaser in which logs are brought to adjoining landings a different series of letters may be used for each sale.

In large sales serial numbers need not be continued throughout the contract, since numbering is intended only for the identification of individual logs. It is usually sufficient to number logs consecutively to the end of each scale book, beginning the next book with

No. 1. The series should not be changed so frequently, however, as to make the identification of logs uncertain. There should as a rule be an unbroken series of scale book letters and log numbers covering the cut of each logging season.

End Check on Logs.

As a general rule, every saw log should be check marked on the end which is not numbered. Where a series of scale books is to be used, the initial of the book in which the log is recorded makes the best end check. This practice aids the check scaler in locating the original scale entry, insures getting all the logs in a deck or skidway, and automatically requires the scaler or scalers to see both ends of each log.

Stamping Logs.

Every merchantable log scaled will be stamped "U. S." on at least one end. The stamp signifies an official scale, subsequent to which title to the timber, previously paid for, passes to the purchaser. Logs so defective as to be unmerchantable under the terms of the contract will be plainly marked in one of the following ways, as prescribed by the District Forester: (1) With the "U. S." stamp and a circle around the stamp thus, U. S.; (2) with the word "Cull" and the initials of the scaler.

It is essential that cull logs be plainly distinguished from merchantable logs in the manner prescribed in order to identify the culling as done by a forest officer. The distinguishing mark should be made as permanent as possible. This is necessary to show the disposition made of the log in the event of another officer taking charge of the sale, of checking the area over for penalty scale, or of subsequent inspections of the cutting.

It is essential to distinguish sharply between logs which are merchantable under the rule as to per cent of sound contents specified in the contract and cull logs. No logs should be stamped as merchantable which do not scale the per cent of their gross contents required by the sale agreement. Any log not meeting this qualification should be culled. Free use of all material unmerchantable

under the terms of the contract should always be permitted for sale improvements. Its removal and use for other purposes is discretionary with the District Forester. Logs consisting in part of merchantable and in part of unmerchantable material will be charged for at the contract price for merchantable contents if the merchantable portion would be subject to penalty scale. (See the merchantability clause, Form 202, and "Utilization Requirements" in the National Forest Manual.)

Check on Total Number of Logs.

Unless the logs have been numbered or marked on both sides of the pile or skidway, a practice frequently followed where two men scale together, the logs in each pile or skidway will be counted after scaling, and the total checked with the number of entries in the scale book.

DEDUCTIONS FOR DEFECTS.

The effect of rot and other defects upon logs of different species and in different regions varies so greatly that no rules for making deductions can be applied inflexibly. The constant exercise of good judgment by scalers based upon an accurate knowledge of local timber secured by seeing defective logs opened up under the saw is essential.

Defects are classified as follows:

(1) Interior defects, which cause waste in the interior of logs.
(2) Side defects, which cause waste on the outside of logs.
(3) Defects from curve or sweep.
(4) Defects from crotches.

INTERIOR DEFECTS.

Standard Rule.

The most accurate method mathematically of reducing the scale for interior defects showing in one or both ends of the log is to treat the defects as sawed out in squares or rectangles. The Scribner Decimal C rule is based upon diagrams of 1-inch boards with ¼-inch kerf. Twenty per cent of any square or rectangle inside the slabbed surfaces of the log is, therefore, deducted for kerf in the rule. This deduction is carried in scaling sound timber, and hence should not be included in allowances for defect.

In applying this rule the scaler first measures the end dimensions of the square or rectangle which will be wasted in manufacture and determine its length. A slight allowance in excess of the dimensions bounding the actual defect is made to cover the loss in sound material surrounding the defect which must be discarded with the defective material. This incidental loss will vary from ½ inch in small logs to 1 inch in larger logs, and is added to the actual diameter of the defect to give its total dimensions. From its computed contents in board feet 20 per cent is deducted as the scale rule's allowance for saw kerf and the remainder raised or lowered to the nearest 10. The gross scale of the log is then reduced by this amount.

The substance of this method is to deduct 80 per cent of the board foot contents of a piece of timber having the same dimensions as the defect. The entire process may be stated algebraically as follows: If a and b represent the end dimensions of the defect in inches, l the length of the defect in feet, Y its solid contents in board feet, and X its contents in board feet after 20 per cent is deducted for kerf, X, or the net reduction to be made in the scale, may be obtained as follows:

$$\frac{a \times b \times l}{12} = Y. \qquad X = Y - 0.20 \times Y$$

or, reducing these equations to their simplest form,

$$X = \frac{a \times b \times l}{15}$$

X must then be raised or lowered to the nearest 10.

For example, a defect squaring 5 inches extends through a 16-foot log. $\frac{5 \times 5 \times 16}{15} = 26\frac{2}{3}$, or rounded to the nearest 10, 30 board feet, the allowance for defect to be taken from the gross scale of the log.

For example, the waste in cutting out a defect which extends through a 16-foot log is 4×9 inches. $\frac{4 \times 9 \times 16}{15} = 38.4$, or 40 board feet, the net allowance for the defect.

Table 3 on page 58 of the Appendix gives, in lengths of from 6 to 32 feet, deductions for interior defects which square from 2 to 30 inches.

Table 2 on page 48 gives deductions for similar defects which must be cut out in rectangles.

Where defects of these classes show in both ends of the log the larger dimensions are taken in logs 16 feet and under in length, and the average dimensions in logs over 16 feet. If a defect does not appear in both ends of the log the scaler estimates its length, taking the other dimensions in full as shown at the defective end.

It will be the standard practice in Service scaling to use the above rule, for which tables are given on pages 48 to 59, in deducting for interior defects. It is not applicable, however, in deducting for certain forms of butt rot, as later explained. Exception to its application is permitted in deducting for center and circular rot where it is clearly evident that the rules of thumb given under "Center or circular rot" secure equally satisfactory results.

Center or Circular Rot.

In applying the standard rule for interior defects, the defect should be squared or inclosed in a rectangle and the proper deduction determined in accordance with the preceding instructions.

Many rules of thumb for determining the deduction for center or circular rot are in common use. These are usually too inaccurate for Service scaling. The following have been selected as giving results close to those obtained by the standard rule and may be used, if desired, in lieu of the standard rule:

Obtain the average diameter of the rot at each end of the log and average these two figures. Add to the average diameter:

$\frac{1}{2}$ if it is 9 inches or less.

$\frac{1}{3}$ if it is from 10 to 19 inches, inclusive.

$\frac{1}{4}$ if it exceeds 19 inches.

Obtain the scale of a log of this diameter, as extended, and the same length as the log in question. Deduct this amount from the gross scale of the log.

In the case of 16-foot logs *only* the deduction for circular rot of 8 inches in diameter or less can be obtained by squaring the diameter

of the defect in inches and rounding off to the nearest multiple of 10. If the average diameter is 7 inches, for example, its square would be 49, or rounded off, 50 board feet. (Read as 5 in the Scribner Decimal C log rule.)

Ground or Stump Rot.

Ground or stump rot in butt logs seldom extends far into the log and usually tapers to a point. If it joins center rot from above or extends well up into the log, the defect comes under center or circular rot.

Where stump rot spreads from the center of the log to within a short distance of the bark, a section of the log containing the defect should be cut out in scaling. Additional allowance should be made as under center or circular rot if the defect extends into the log above the section cut out.

The scaler must exercise judgment in deducting for ground rot, comparing the diameter of the defect with that of the butt and sighting along the log to see if any boards can be cut from sound material outside of the rot. Where this defect occurs on only one side of the butt, it usually extends but a short distance into the log. Much of it will frequently come out in the slab, especially where there is considerable "flare" or swell.

Circular Shake or Pitch Rings.

The standard rule for interior defects, or the rules of thumb given under "Center or circular rot," page 19, should be applied to the material within the outer shake or pitch ring. In applying the standard rule, a sound core of merchantable size inside of the shake or pitch ring should be scaled as a separate log. The difference between its scale and the amount of material obtained by squaring the outer dimensions of the defect is the net deduction from the full scale of the log.

Pin Dote or Peck.

Pin dote or peck appears on the ends of logs as little rotten spots or pockets usually occurring in a roughly circular area. Logs containing it may "open up" poorly, the doty spots frequently converging and forming a mass of more or less broken-down material. It

often extends into knots. The scaler should make allowance for defects of this character by the rule applicable to the location and extent of the defect in the log.

Check or Pitch Seam.

The scaler should first ascertain whether the seam shows at both ends of the log and if it is straight or twisted. The greater the twist, the larger will be the amount of waste. If the seam shows at only one end of the log, the distance which it extends into the log must be measured. The dimensions of waste material in sawing the seam out should also be measured on the end of the log. Deduction for the defect should then be determined under the standard rule for interior defects. When the check or seam extends across the entire end of the log the width of the defect used in applying the rule is the diameter of the log within the slabbed surface.

Dote Appearing in Knots.

Defect in the log is sometimes shown only by rot or dote in the knots. No fixed rule can be applied in such cases. Deductions must be made in accordance with the scaler's knowledge of how such logs "open up."

Dote in knots is often an indication of an enlarged area of rot in adjoining portions of the log. When rot appears both at the ends of a log and in its knots, the deduction should ordinarily be from 25 to 50 per cent greater, depending on the number of knots affected and their size and position, than when the ends alone are defective.

Wormholes.

Deductions for wormholes depend upon their number and extent. A few scattered holes can ordinarily be disregarded. Where such holes are so numerous or so large as to clearly cull the material affected, deductions should be made as for other interior defects. Knowledge of how wormy logs open up is necessary for accurate scaling in such timber.

SIDE DEFECTS.

Scalers should not lose sight of the fact that the waste caused by defects on the side of a log is much less than in the case of defects near the center, since much of the unsound material will come out in

slabbing, or is outside of the cylinder represented by the top end of the log and its total length. This is especially true of defects on butt logs with considerable flare or swell.

Unsound Sap.

The sound heartwood alone should be scaled in logs with a shell of unsound sap.

Sound blue sap or firm stain, not broken down or worm-eaten, will not ordinarily be regarded as a defect.

Checks.

Where a number of deep checks extend from the surface toward the center of a log, the scaler will measure the diameter of the sound core within the largest circle which can be described on the scaling end without being seriously cut into by checks. All material outside of this circle should be thrown out as defective. The sound core will usually be measured on the small end of the log. If the core of solid material is smaller at the butt end, however, measurement should be made there for scaling. For deductions for single checks see "Check or pitch seam," page 22.

Cat Face.

When the rules for interior defect are not applicable, the following procedure may be followed in making deduction for cat face:

Divide the log into sections, throwing the defect into one section. The scaler then determines what part of the total length of the log is affected, finds the contents of this section on his scale stick, and determines the portion of the section which will be lost in sawing, The latter is then deducted from the gross scale of the log.

For example, in the butt of a 16-foot log with a top diameter of 24 inches, scaling 400 feet b. m., there is a cat face 5 feet long extending to the heart of the log. The cat face tapers toward the top, where it will come out in slabbing and affects about 4 feet of the log. The 4-foot section affected contains one-fourth of the scale of the log, or 100 feet b. m. The defect will throw out one-half of this 4-foot section, or 50 feet b. m., the amount to be deducted. Here again judgment and knowledge of the timber are necessary. While

the defect may extend to the heart of the stump, it may taper rapidly toward the top and perhaps affect only one-third or less of the section.

Other Side Defects.

In culling for other side defects, like those caused by lightning or fire, the scaler should determine the depth of the defect. If it will not be cut off in slabbing, proper deductions should be made by measuring the loss in accordance with the appropriate rule, i. e., for interior defects, cat face, or unsound sap; or, in the case of very irregular patches of waste, by estimating the percentage of the log affected.

Minimum Length and Width of Lumber.

It is of special importance in deducting for side defects to bear in mind the minimum length and width of material considered merchantable in Service scaling. (See p. 9.)

CURVE OR SWEEP.

The percentage of waste from sweep or curve varies with the diameter of the log. A curve of 3 inches in a 10-inch log will cause approximately twice the proportionate waste as the same curve in a 20-inch log. Sweep which would cull a very small log would not necessarily cause the rejection of a large log.

The scaler should sight along a curved log, noting where the saw will square it sufficiently to cut boards on both sides affected by the curve. In determining the amount of loss it should be remembered that material near the slab saws out narrow boards containing fewer feet than those cut from any other part of the log.

Deductions will be made for curve or sweep in logs of any length only to the extent that material in them can not be used for boards of the minimum length utilized in the milling practice of the region.

CROTCHES.

If the log is crotched proper deduction should be made in the scale, usually by reducing the length. In any case where a crotch occurs the scaler should obtain the average diameter of the log just below the swelling caused by the crotch. This may be done by measuring the diameter at the butt and making the usual allowance for taper.

DETERMINING THE MERCHANTABILITY OF LOGS.

The per cent of the total scale of a log, which determines its merchantability, should always be reckoned from the full scale, including unsound sap, checks, curve, and any other defects present.

SCALING GREEN AND DEAD TIMBER.

In sales which include green and dead timber at separate stumpage prices the scaler should not attempt to trace logs from the tree to establish their character, but may classify them on the appearance of the log at the point of scaling. (See Standard Clause 34, National Forest Manual.)

PENALTY SCALE.

The penalty-scale clause of Form 202 provides for liquidated damages to cover losses to the United States which result from leaving material in the woods or cutting contrary to the terms of the contract.

Enforcement of the penalty-scale clause is necessary except in accidental or exceptional cases involving small amounts of timber, where it may be waived by the officer in charge. Whenever waste subject to the penalty-scale clause occurs, the officer in charge will notify the purchaser and call his attention to the utilization required by the contract. In order to avoid later controversy notification should be given in writing. If further waste occurs, or if material perviously left in the woods whose utilization is practicable is not removed, a penalty scale should be made of all such material and reported to the supervisor.

Penalty material should be scaled as promptly as practicable, and in any case immediately after the completion of operations upon a logging unit.

Material subject to this requirement (penalty-scale clause, Form 202) will be scaled, stamped, and numbered as in the regular scale, and recorded as indicated on page 38.

SCALING LOGS.

Under the scaling-length clause of Form 202, logs overrunning the specified allowance for trimming will be scaled not to exceed the next foot in length. If a scaler finds frequent violations of the trimming

overrun, he should notify the purchaser, preferably in writing. If further violations occur, he should measure all logs and scale as 1 foot longer any pieces overrunning the trimming allowance. Penalty scaling of this character will be noted plainly in the scale book against the number of the log to avoid possible controversy.

SETTLEMENT OF COMPLAINTS.

It is the policy of the Forest Service to ascertain the justice of responsible complaints by a check scale conducted by a more competent and experienced scaler, not by lumber tallies or mill checks on the log scale. If the results of the first check are questioned upon apparently good grounds, a second check may be made by another scaler. Complaints will be settled by mill checks only in extreme and exceptional cases where on account of the defective character of the logs the judgment of the most competent scaler may be seriously in error.

CHECK SCALING.

The chief purpose of check scaling is to make and keep the current scale in all classes of sales accurate by indicating sources of error, and particularly by instructing scalers on the ground. Systematic check scaling is therefore a necessary part of the timber sales organization.

So far as practicable a check scale should be made at least once a year on every sale of 1,000,000 feet or more. Smaller sales should be checked as frequently as may be necessary to properly train the local officers in charge of them. Checking the scale of rangers who have but little sales work is of special importance, since the most serious errors occur in such cases.

As many logs as practicable should be scaled by the check scaler after they have been scaled by the local officer and without knowledge of his figures. The check will then be compared with the original scale. The log numbers, lengths, and scale given in the original scale record for the particular logs on which a check scale has been made will be recorded in the check scaler's book and the pages cut out and filed in the supervisor's office with a copy of the check scaler's report. Check scale figures may be submitted in the

form considered most satisfactory by the district forester for analysis. The following summary form will be found satisfactory in most cases:

	Sound logs.			Unsound logs.			Total.		
	Number of logs.	Scale.	Per cent, + or −.	Number of logs.	Scale.	Per cent, + or −.	Number of logs.	Scale.	Per cent, + or −.
Scale by									
Check scale by									

Ordinarily a check scale on sound logs should come within 1 per cent of the original scale; on logs up to 10 per cent defective, within 2 per cent; on logs 11 to 20 per cent defective, within 3 per cent; and on logs over 20 per cent defective, within 5 per cent. As far as practicable the check scale should be made under the same conditions as the original scale. These percentages are intended simply as approximate standards of satisfactory scaling for the guidance of forest officers, not as a basis for changing the original scale.

The findings of check scalers will be reported uniformly to the district forester. The original scale will be modified only when found to have been fundamentally wrong in method or in the treatment of important defects and when it is clear that serious injustice has been done to the purchaser. Changes will be made only with the approval of the district forester.

MILL SCALE STUDIES.

Aside from their occasional need for the settlement of complaints (see p. 26), mill-scale studies should be made to obtain accurate data on lumber yields and overrun by grades for use in stumpage appraisals. Detailed working plans should be prepared and approved by the Forester before studies of this kind are initiated.

Wherever practicable, especially in the case of defective timber, logs should be followed through the mill by scalers. The object of simple mill checks of this nature is (1) to train the scaler's judgment

by seeing how individual defects open up in the logs and reduce the cut of sound lumber, and (2) to obtain a check on the total yield of lumber from logs containing various defects as compared with the scale. The amount to be deducted in scaling for particular kinds of defects is the most important thing to learn from such mill checks.

SCALING FROM THE STUMP.

Use of Stump Scales.

A stump scale is obviously less accurate than a scale of logs, even when measurements are most carefully made. Stump scales should never be used, therefore, when log scales are practicable. This method will be employed only in timber trespasses and other cases where the logs have been removed and a log scale is impossible.

In Timber Trespass.

The total log lengths cut from each tree should be measured in making a stump scale of a timber trespass. Often the indentation in the ground where the butt struck in felling can be located. From that point, which may be several feet from the stump, the total log length should be measured to the top, the direction of which can usually be determined by the undercut on the stump. The total length should be divided into logs in accordance with Taper Tables 9 or 10 on pages 69, 70, and 71 of the Appendix, and the instructions on page 14. The diameter of each log should be ascertained from the table or estimated from the total length and the top and stump diameters. The scale of each log may then be obtained from a scale stick or Table 1 on page 42 of the Appendix. Merchantable timber left in tops, in high stumps, and in unused logs should be scaled and entered separately. After scaling each tree the top of the stump and the butt of the top should be stamped "U. S." Deductions from the scale should be made for cull in accordance with the best data available for the class of timber concerned.

Where the tops can not be identified or have been moved or destroyed by fire, the scale may be obtained from the best volume table available for the locality and species by reducing the diameter at the top of the stump to diameter breast high. Volume tables may be used in lieu of stump scales, particularly when heights can be

checked on trees bordering the cutting, if the results of this method are believed to be more accurate.

Forest officers should use extreme care in scaling trespass timber, especially by a stump scale, and should keep complete notes of the method used. If the case is brought into court, the scale and methods used in detail must be introduced as legal evidence.

CUBIC MEASUREMENTS.

Policy.

The cubic content of timber may be measured (1) by the cord or (2) by the cubic foot. Cubic-foot measurements may, for determining stumpage payments, be converted into cords or board feet in accordance with a converting factor specified in the contract.

Merchantable Timber.

Standards of merchantability should be specified in contracts as in sales of saw timber. These standards should conform to the best trade practice for each species and class of material in the region and as far as practicable should cover the points specified on pages 11 and 12 for material measured by log scale, namely, minimum length of merchantable pieces, minimum diameter, proportion of defective material admissible, and treatment of common defects in scaling.

Requirements of Purchasers.

The requirements of purchasers will be similar to those in saw-timber sales. (See p. 13.) Ricks for cord measure must be sufficiently regular to permit reasonably accurate measurement.

In sales of shingle stock where the officer in charge may determine the number of bolts to the cord, purchasers should be required to rick bolts only in case of question as to the proper number or to check the number currently used.

Check Measurements.

Check measurements will be made in accordance with the instructions for Check scaling, page 26. The same procedure should be followed as regards the frequency of checks in sales of varying size, the methods of conducting and reporting the check, and action to rectify the original scale.

CORD MEASURE.

Policy.

Fuel wood will ordinarily be sold by the cord. Pulpwood, shake and shingle bolts, cooperage bolts, furniture bolts, acid wood, and bark may be sold by the cord or by other units of measure common in the local trade. In sales of shake or shingle bolts the unit of measure will ordinarily be the sound cord—that is, sound material equivalent to one cord—rather than the measured cord, which may include some defective material. This requires throwing in additional bolts to make up for defective parts of the bolts constituting a measured cord. The same rule may be followed in the case of other material sold by the cord, if desirable to draw the contract in this form.

If cord dimensions differing from the standard of 8 feet long, 4 feet wide, and 4 feet high, with a volume of 128 cubic feet, are to be used, they should be specified in the contract, as when the long cord, 8 by 4 by 5 feet, with a volume of 160 cubic feet, is to be used for pulpwood or bark, or widths narrower than 4 feet are to be used for fuel wood or bolts.

Cord Measurements.

Measurements of ricks will be taken with a tape in feet and tenths. Where ricks are standing on slopes, the length of the rick parallel to the slope will be measured and the height at right angles to this plane. If end stakes are used, the length of ricks should be measured one-half of the distance between top and bottom; otherwise, at two or more places to obtain a fair average. The height should be measured at several places to give the true average.

In sales of fuel wood where a majority of the pieces in a rick are 3 inches more or less than the standard lengths, the rick should be measured, computed, and charged for on its actual cubic contents.

In sales of bolts of specified dimensions the lengths should be checked sufficiently to make sure that they do not regularly overrun the allowance specified in the contract. If overrun is general, the procedure should follow that outlined under penalty scale on page 25.

To compute the number of standard cords of 128 cubic feet, in ricks 4 feet wide, multiply the height by the length of the rick in feet and divide by 32. If the length of the wood is greater or less than 4 feet, multiply length, width, and height and divide by 128.

Stamping and Numbering.

Both the top and bottom of each rick and at least 12 pieces in each cord must be stamped. Each rick will be numbered. The measurements and contents of each rick should be entered opposite its number in the scale book. Where bolts are counted and the number per cord estimated by the forest officer, each bolt should be stamped.

CUBIC-FOOT MEASURE.

Policy.

Sales by cubic-foot measure will be encouraged in order to place timber measurements on a more exact basis and permit accurate comparison of scientific and practical data. It will be the standard policy of the Forest Service to sell pulpwood by the cubic foot, with a converting equivalent to cords or board feet named in the contract where necessary. The specification of a converting factor makes it possible, particularly in the case of fuel or pulpwood, to adjust the method of measurement to the form in which the material is cut. The basis of measurement in sales of other classes of material should be changed to the cubic standard whenever practicable

Measurements.

Two measurements are necessary—the average diameter of the log at its middle point in inches and its total length in feet. The former may be secured by calipers and the latter by tape. If the log is irregular in shape the average middle diameter should be secured.

Proper deductions should be made for the thickness of the bark. Recorded diameters should be rounded off to the nearest inch above or below the actual measurement. Logs having a diameter exactly halfway between inches will be thrown to the next lower inch.

The length of logs should be obtained in feet. Lengths should be rounded off to the nearest foot above or below the actual measurement. Logs whose length is halfway between feet should be thrown to the next lower foot. Pieces exceeding 40 feet in length should be measured as two logs of as nearly equal length as possible, and pieces exceeding 80 feet as three logs. When pieces are measured as two or more logs the contents allowed for the separate lengths should be added and the total recorded as one log.

The volume in cubic feet may be obtained directly from Table 4 on page 60 of the Appendix, which contains the solid contents of logs in cubic feet for average middle diameters from 3 to 60 inches, and for lengths from 4 to 40 feet.

Table 8 on page 68 of the Appendix gives the area in square feet of circles from 1 to 80 inches in diameter. This may be used for computing volumes in cubic feet, by multiplying the area of the middle cross section of the log in square feet by the length.

Deductions for Defect.

Deductions for defect should be made, in cubic-foot measurements, in accordance with the general methods discussed for scaling saw timber, page 18. The solid volume in cubic feet of waste material as determined by the surface dimensions of the defect in square or rectangular form, times its length, should be deducted from the total cubic volume of the log. Since no allowance is made for saw kerf in cubic measurement, the 20 per cent reduction required in determining net loss of log scale by the board foot does not apply in this case.

Unless it is certain that the logs will be sawed into lumber, no deductions should be made in cubic-foot measurements for curve or sweep, crotches or knots. Deductions should be made, however, for unsound material of any character which affects the merchantability of the log for the particular product of the sale.

LINEAR MEASUREMENTS.

Policy.

Lagging, posts, piling, fence poles, converter poles, telephone poles, stulls, and mine timbers may be sold by the linear foot.

Merchantable Timber.

The instructions under "Definition of merchantable logs," page 11, should be followed. Timber sale contracts should specify the minimum length and top diameter of sticks classed as merchantable for each product. Maximum lengths and diameters should be designated in contracts under which higher prices are to be paid for products cut from the larger material. It is especially necessary in sales of cedar covering both poles and other products to specify the

dimensions of material to be used for each product. (See Standard Clause 16, National Forest Manual.)

Similar specifications should cover wherever necessary the amount and kinds of defect admissible in products sold by the linear foot or the character of the material held to be merchantable for these purposes. This is of special importance in the case of valuable products like telephone poles and stulls which usually require the best grades of timber. The current specifications of local associations of pole dealers and the like should be followed as regards the area of defect admitted in the butts of poles of various diameters and similar points affecting merchantability.

Requirements of Purchasers.

The requirements of purchasers will be similar to those specified on page 13. If products sold by the linear foot are to be cut in several standard lengths, purchasers may be required to pile or deck each length separately, if practicable and necessary to permit economical measurement.

Measurement.

Measurements of length only are required. Where pieces are cut in uniform, standard lengths, actual measurement is necessary only in doubtful cases and at short intervals to check the lengths employed by the choppers. When several products are cut in the same sale, or prices depend upon both diameter and length, a similar current check should be made of the diameter of linear-foot material.

The standard allowance for trimming in cutting telephone poles is 1 inch for each 5 feet of length. Penalty measurements for lengths in excess of the trimming allowance will follow the provisions of the contract in accordance with the procedure outlined under "Penalty scale," page 25. Wherever advisable contracts should specify trimming allowances for other classes of material.

Board Foot Equivalents.

If desirable, contracts may specify equivalents in a thousand feet board measure for a stated number of linear feet. (See Standard

Clause 27, National Forest Manual.) This facilitates the application of a flat stumpage rate. As a standard practice, however, it is preferable to require payment for such material on a linear-foot basis.

Stamping and Numbering.

Each stick measured must be stamped on at least one end.

Each pile of material measured should be numbered with crayon in the case of lagging, posts, fence poles, converter poles, or other material where individual pieces are small and of little value. The number of pieces in each pile and their linear-foot contents will be entered opposite the pile number in the scale book. Large pieces, like telephone poles, piling, and 16-foot stulls, equivalent in value to saw logs, should each receive a number. The scale of each piece should be entered opposite its number in the scale book.

Check Measurements.

Check measurements will be made in accordance with the instructions for Check scaling, page 26, and for Check measurements, page 29.

Combined Linear and Diameter Measurements.

Where the market value of products like telephone poles and stulls varies widely in accordance with top diameter as well as length, a schedule of stumpage rates for the various lengths and sizes should be used. In such sales the top diameter of each piece must be accurately measured, an average diameter being obtained in the case of sticks of irregular shape. Diameters will be averaged to the nearest inch, unless taking the next lower inch has been agreed upon in advance with the purchaser and is specifically required by the contract. If different lengths are cut, they should be measured on not less than 25 per cent of the pieces. Every piece should be given a separate number and entry in the scale book, as in the case of saw logs.

COUNTING.

Policy.

Hewn ties sold by the piece, in accordance with the standard practice of the Forest Service, will be counted. Ties will also be counted in sales where their board-foot contents are specified by the agree-

ment. In the exceptional cases in which ties are scaled the instructions under scaling will be followed. Shingle bolts will be counted when contracts specify that the number of bolts to the cord will be determined by the scaler.

Lagging, poles, posts, etc., will be counted when sold by the piece.

Merchantable Timber.

The instructions under "Definition of merchantable logs," page 11, will be followed unless otherwise provided in the contract. Contract requirements should conform with the local market specifications of the product concerned. Special contract clauses should be used to designate unmistakably the maximum and minimum sizes of pieces which are to be counted rather than scaled. (See Standard Clauses 14 and 15, National Forest Manual.) Such clauses should include any specifications as to defect or class of material necessary to establish beyond question what timber is merchantable for these products.

Requirements of Purchasers.

The requirements of purchasers should be similar to those outlined on page 13.

Stamping and Numbering.

When counted each stick of mine timbers, ties, posts, or poles must be stamped on at least one end.

Each pile of material must be numbered with crayon even though it will be removed immediately. The number of pieces will be entered opposite the number of the pile in the scale book.

Check Measurements.

Check measurements will be made in accordance with the instructions under Check scaling, page 26, and Check measurements, page 29.

Sample sheets of Forms 231, 231–D1, and 651, on pages 72, 74, 76, and 78 of the Appendix show the proper method of keeping scale records of saw timber.

Sample sheets of Forms 231 and 231–D1 on pages 86 and 88 of the Appendix show standard methods of recording measurements and counts of telephone poles and piling sold by the linear foot and piece.

A sample sheet of Form 648 on page 90 of the Appendix shows the standard method of recording measurements and counts of mining timbers sold by the linear foot, and ties and posts sold by the piece.

A sample sheet of Form 231 on page 80 of the Appendix shows the standard method of recording cubic feet and cords.

A sample sheet of Form 651 on page 84 of the Appendix shows an excellent method of counting shingle bolts on an average number per cord and recording the count in cords.

A sample sheet of Form 648 on page 82 of the Appendix shows the standard method of recording measurements of fuel wood sold by the cord.

WEIGHING.

Bark may be sold by the ton when this method accords with the best trade practice of the region and scales are available on which weights may be taken by forest officers or checked when taken by agents of common carriers. If the long rather than the standard ton is to be used, this must be specified in the contract.

RECORDS AND REPORTS.

Scale Books.

The scale or measurement of logs or other material will be entered by scalers directly in one of the following standard scale books, unless not suitable, in which case authority to use a special form of scale book should be secured from the Forester:

Form 223 (large size).

Form 231 (small size; for "Free Use" and Class A and B sales).

Form 231–D1 (large and small sizes).

Form 648 (small size only).

Form 651 (large size only).

Form 122 (large size only; Comparative Scale Book, for use in check scaling).

Scale records will not be entered in other notebooks or on loose slips of paper to be transferred to scale books later, except under exceptional conditions where the cost of scaling would be materially increased or the purchaser seriously inconvenienced by adhering to

the standard practice. Temporary scale records must be transferred to the regular scale book as soon as practicable and the temporary record fastened permanently to the page of the scale book on which the entries are made. The use of celluloid sheets from which the scale is to be transferred to the scale book is authorized when weather conditions make it imperative. The original scale books, after all entries have been made and checked, will be kept in the supervisor's office in all advertised sales, and in the ranger's office in unadvertised sales. Logs, pieces, or piles of material should be numbered and their scale, cubic contents, linear feet, number of sticks, or number of cords, with the other data called for on these forms, entered opposite each serial number in accordance with the instructions on numbering, pages 15, 31, 34, and 35.

When pieces are scaled as two or more logs the scale allowed for the separate lengths will be added and the total sum recorded as one log.

Similarly, when pieces are measured by the cubic foot as two or more logs, the dimensions of the whole piece should be entered under a single serial number, the cubic contents of the separate lengths added, and the total recorded as one log.

So far as scaling forms allow, the following information should be given for each class of material scaled, measured, or counted:

Saw timber: Serial number of each log, length, net scale, and deductions for defect.

Poles and piling (where sold on piece basis of specified length and diameter): Serial number of each piece, length, and diameter.

Cord material: Serial number of each rick, dimensions of rick in feet and tenths, and its contents in cords and fractions of cords.

Cubic-foot material: Serial number of each log, its length in feet, middle diameter in inches, net contents in cubic feet, and deductions for defect.

Linear material: Serial number of each pile and number of pieces of specified class and lengths.

Material counted: Serial number of each pile and number of pieces, by special class and length if necessary.

Material weighed: Number of pounds or tons with identification by car shipment or otherwise.

Where no column is given for cull, the figure can be entered in the space for the net scale, inclosed in a circle, thus: (6). Entries of the diameter of saw logs and notes on the kind of defect are desirable, in addition to those specified above. They may be required in the discretion of the district forester.

Penalty Scale Records.

Separate scale books will be kept in large sales for material covered by penalty scale under the penalty-scale clause of the timber-sale contract, Form 202. A separate record of such material will be kept in small sales. A single scale of all classes of timber subject to the penalty will be entered in this record, but separate entries must be carried for each class to which a different charge applies. Each set of entries should be given a heading indicating the charge applicable. The following may occur:

Material not previously scaled, to be charged for at double the stumpage rate.

Material not previously scaled, to be charged for at the regular, or single, stumpage rate.

In exceptional cases, material previously scaled, to be charged for at double rates.

The original log numbers of material in the latter class will be recorded in the penalty-scale record, the heading indicating that the regular stumpage prices have already been charged.

The record of penalty scale for overrunning trimming allowance under the scaling-length clause of Form 202 should be noted on the original scale sheets against the number of each log concerned.

Check of Scale Books.

All additions and computations in scale books, including figures read from tables, will be checked either in the supervisor's or district office as the district forester may direct. If errors are found, the necessary corrections will be entered on Form 820, supplementing the last scale report of record in the sale.

Cutting Reports.

The forest officer in charge will notify the supervisor when cutting begins on any advertised sale. The scale in all sales will be reported to the supervisor on Form 820, and a duplicate retained in the ranger's files. In unadvertised sales only the final report need be submitted to the supervisor. Cutting reports will be submitted in advertised sales while work is in progress, covering periods of one, two, three, or four weeks, as may be required by the supervisor, but ordinarily ending on Saturday. Special dates may be set by supervisors for submitting cutting reports, as may be most convenient for them or for purchasers. As far as practicable the wishes and needs of purchasers should be met in fixing dates for the submission of reports.

Penalty Scale Reports.

Reports of penalty scale should be made separately from the regular scale. Separate reports may be submitted on Form 820, properly labeled, or, where small quantities of material are reported at infrequent intervals, entries may be made on the back of Form 820 under "Remarks." Whenever penalty scale is reported, the "Total previously reported," "Total since last report," and "Total to date" should be given. If separate Forms 820 are used, they should constitute an independent series. Entries under "Remarks" need be made only in reports for periods during which a penalty scale has actually been made and in the final report for the sale.

Check and Record of Cutting Reports.

As cutting reports (Form 820) are received, they should be compared with the timber-sales record card for errors in entries brought forward from the last report and for the correctness of the rates. All calculations will be checked and the information regarding the progress of the sale scrutinized. The date of the report, quantity of each class of material cut, reduced to feet, board measure, by approved converting factors, and total value of material cut since the last report and to date will be entered on the record card. The total value of the cut to date will be compared with the total deposits to prevent cutting in excess of payments.

Scale Records for Purchasers.

Unless deemed inadvisable by the officer in charge or by the supervisor, the scale of individual logs, measurement of individual pieces or ricks, or count of particular piles of timber-sale products should be given to purchasers upon request, either in person or by letter. Similarly, the complete scale record may be opened to the purchaser at any time in the presence of a forest officer. Supervisors should inform purchasers of the scale to date at regular periods, either by letter or by furnishing approved cutting reports on Form 820 without entries on the back.

Report of Timber Sold and Cut.

The monthly report on Form 949 will be mailed to the district forester by the supervisor not later than the fifth of the succeeding month, even if no timber has been sold or cut during the month. It will be compiled from all Forms 615, which will not be placed in the closed records until the end of the month. All timber for which payment is made, whether cut in sales, administrative use, or timber settlement, will be included. The date of approval of the agreement or stipulation will be taken in each case as the date of sale, even though an emergency sale may have been made in advance. The day when each cutting report is received will be taken as the date of cutting. All data will be checked before the report is forwarded. If a flat rate has been applied to green and dead timber, the two classes may be prorated in the scale report, Form 949, on the basis of their ratio in the original estimate.

The amount and value of the timber sold and cut, respectively, in sales at cost under Regulation S-22 will be reported separately.

The report should include a statement of the amount of timber previously reported as sold which will not be cut owing to cancellations or modifications of contracts during the month.

District Forester's Monthly Report.

As soon as practicable after the first of each month the district forester will report to the Forester the amount and value of green and dead timber sold and cut, respectively, during the preceding month, by Forests. This report should include a statement of the

amount of timber previously reported as sold which will not be cut owing to cancellations or modifications of contracts during the month.

It will not be necessary to include in this statement the "overcut" or "undercut" in sales which were closed during the preceding month.

Annual Report.

The annual report will be compiled from the monthly reports.

Report on Miscellaneous Products.

Sales of miscellaneous forest products, such as Christmas trees, naval stores, seedlings, etc., should be reported in a footnote to the district forester's monthly and annual report of timber cut and sold.

APPENDIX.

TABLE 1.—SCRIBNER DECIMAL C LOG RULE.

6 TO 18 FOOT LOGS.

Diameter.	Length—feet.												
	6	7	8	9	10	11	12	13	14	15	16	17	18
	Contents—board feet in tens.												
Ins.													
6	0.5	0.5	0.5	0.5	1	1	1	1	1	1	2	2	2
7	.5	1	1	1	1	2	2	2	2	2	3	3	3
8	1	1	1	1	2	2	2	2	2	2	3	3	3
9	1	2	2	2	3	3	3	3	3	3	4	4	4
10	2	2	3	3	3	3	3	4	4	5	6	6	6
11	2	2	3	3	4	4	4	5	5	6	7	7	8
12	3	3	4	4	5	5	6	6	7	7	8	8	9
13	4	4	5	5	6	7	7	8	8	9	10	10	11
14	4	5	6	6	7	8	9	9	10	11	11	12	13
15	5	6	7	8	9	10	11	12	12	13	14	15	16
16	6	7	8	9	10	11	12	13	14	15	16	17	18
17	7	8	9	10	12	13	14	15	16	17	18	20	21
18	8	9	11	12	13	15	16	17	19	20	21	23	24
19	9	10	12	13	15	16	18	19	21	22	24	25	27
20	11	12	14	16	17	19	21	23	24	26	28	30	31
21	12	13	15	17	19	21	23	25	27	28	30	32	34
22	13	15	17	19	21	23	25	27	29	31	33	35	38
23	14	16	19	21	23	26	28	31	33	35	38	40	42
24	15	18	21	23	25	28	30	33	35	38	40	43	45
25	17	20	23	26	29	31	34	37	40	43	46	49	52
26	19	22	25	28	31	34	37	41	44	47	50	53	56
27	21	24	27	31	34	38	41	44	48	51	55	58	62
28	22	25	29	33	36	40	44	47	51	54	58	62	65
29	23	27	31	35	38	42	46	49	53	57	61	65	68
30	25	29	33	37	41	45	49	53	57	62	66	70	74
31	27	31	36	40	44	49	53	58	62	67	71	75	80
32	28	32	37	41	46	51	55	60	64	69	74	78	83
33	29	34	39	44	49	54	59	64	69	73	78	83	88
34	30	35	40	45	50	55	60	65	70	75	80	85	90
35	33	38	44	49	55	60	66	71	77	82	88	93	98
36	35	40	46	52	58	63	69	75	81	86	92	98	104
37	39	45	51	58	64	71	77	84	90	96	103	109	116
38	40	47	54	60	67	73	80	87	93	100	107	113	120
39	42	49	56	63	70	77	84	91	98	105	112	119	126
40	45	53	60	68	75	83	90	98	105	113	120	128	135

TABLE 1.—SCRIBNER DECIMAL C LOG RULE—Continued.

19 TO 32 FOOT LOGS.

Diameter.	Length—feet.													
	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.													
Ins.														
6	2	2	2	3	3	3	3	3	4	4	4	4	5	5
7	3	3	3	4	4	4	4	4	5	5	5	5	6	6
8	3	3	4	4	4	4	5	5	5	6	6	6	7	7
9	4	4	5	5	5	6	6	6	7	7	8	8	9	9
10	7	7	7	8	8	9	9	9	10	10	11	11	12	12
11	8	8	9	9	10	10	11	11	12	12	13	13	14	14
12	9	10	10	11	11	12	12	13	13	14	14	15	15	16
13	12	12	13	13	14	15	15	16	16	17	18	18	19	19
14	14	14	15	16	16	17	18	19	19	20	21	21	22	23
15	17	18	19	20	20	21	22	23	24	25	26	27	28	28
16	19	20	21	22	23	24	25	26	27	28	29	30	31	32
17	22	23	24	25	27	28	29	30	31	32	33	35	36	37
18	25	27	28	29	31	32	33	35	36	37	39	40	41	43
19	28	30	31	33	34	36	37	39	40	42	43	45	46	48
20	33	35	37	38	40	42	44	45	47	49	51	52	54	56
21	36	38	40	42	44	46	47	49	51	53	55	57	59	61
22	40	42	44	46	48	50	52	54	56	58	60	63	65	67
23	45	47	49	52	54	57	59	61	64	66	68	71	73	75
24	48	50	53	55	57	61	63	66	68	71	73	76	78	81
25	54	57	60	63	66	69	72	75	77	80	83	86	89	92
26	59	62	66	69	72	75	78	82	85	88	91	94	97	100
27	65	68	72	75	79	82	86	89	92	96	99	103	106	110
28	69	73	76	80	84	87	91	95	98	102	105	109	113	116
29	72	76	80	84	88	91	95	99	103	107	110	114	118	122
30	78	82	86	90	94	99	103	107	111	115	119	123	127	131
31	84	89	93	98	102	106	111	115	120	124	129	133	138	142
32	87	92	97	101	106	110	115	120	124	129	133	138	143	147
33	93	98	103	108	113	118	122	127	132	137	142	147	152	157
34	95	100	105	110	115	120	125	130	135	140	145	150	155	160
35	104	109	115	120	126	131	137	142	148	153	159	164	170	175
36	110	115	121	127	132	138	144	150	156	161	167	173	179	185
37	122	129	135	142	148	154	161	167	174	180	187	193	199	206
38	127	133	140	147	153	160	167	174	180	187	193	200	207	214
39	133	140	147	154	161	168	175	182	189	196	203	210	217	224
40	143	150	158	166	173	181	188	196	203	211	218	226	233	241

TABLE 1.—SCRIBNER DECIMAL C LOG RULE—Continued.

6 TO 18 FOOT LOGS—Continued.

Diameter.	Length—feet.												
	6	7	8	9	10	11	12	13	14	15	16	17	18
	Contents—board feet in tens.												
Ins.													
41	48	56	64	72	79	87	95	103	111	119	127	135	143
42	50	59	67	76	84	92	101	109	117	126	134	143	151
43	52	61	70	79	87	96	105	113	122	131	140	148	157
44	56	65	74	83	93	102	111	120	129	139	148	157	166
45	57	66	76	85	95	104	114	123	133	143	152	161	171
46	59	69	79	89	99	109	119	129	139	149	159	169	178
47	62	72	83	93	104	114	124	134	145	155	166	176	186
48	65	76	86	97	108	119	130	140	151	162	173	184	194
49	67	79	90	101	112	124	135	146	157	168	180	191	202
50	70	82	94	105	117	129	140	152	164	175	187	199	211
51	73	85	97	110	122	134	146	158	170	183	195	207	219
52	76	89	101	114	127	139	152	165	177	190	202	215	228
53	79	92	105	118	132	145	158	171	184	197	210	224	237
54	82	96	109	123	137	150	164	177	191	205	218	232	246
55	85	99	113	127	142	156	170	184	198	212	227	241	255
56	88	103	118	132	147	162	176	191	206	220	235	250	264
57	91	107	122	137	152	167	183	198	213	228	244	259	274
58	95	110	126	142	158	174	189	205	221	237	252	268	284
59	98	114	131	147	163	180	196	212	229	245	261	278	294
60	101	118	135	152	169	186	203	220	237	253	270	287	304
61	105	123	140	158	175	193	210	228	245	263	280	298	315
62	108	127	145	163	181	199	217	235	253	271	289	307	325
63	112	131	149	168	187	205	224	243	261	280	299	317	336
64	116	135	154	174	193	213	232	251	270	290	309	329	348
65	119	139	159	179	199	219	239	259	279	299	319	339	358
66	123	144	164	185	206	226	247	268	288	309	329	350	370
67	127	148	170	191	212	233	254	275	297	318	339	360	381
68	131	153	175	197	219	240	262	284	306	328	350	371	393
69	135	158	180	203	226	248	271	294	316	339	361	384	406
70	139	163	186	209	232	256	279	302	325	349	372	395	419
71	144	167	192	215	240	263	287	311	335	359	383	407	430
72	148	173	197	222	247	271	296	321	345	370	395	419	444
73	152	178	203	229	254	280	305	330	356	381	406	432	457
74	157	183	209	236	261	288	314	340	366	393	418	445	471
75	161	188	215	242	269	296	323	350	377	404	430	458	484
76	166	194	221	249	277	304	332	360	387	415	443	470	498
77	171	199	228	256	285	313	341	369	398	426	455	483	511
78	176	205	234	263	293	322	351	380	410	439	468	497	527
79	180	211	240	271	301	331	361	391	421	451	481	511	541
80	185	216	247	278	309	340	371	402	432	464	494	526	556

TABLE 1.—SCRIBNER DECIMAL C LOG RULE—Continued.

19 TO 32 FOOT LOGS—Continued.

Diameter.	Length—feet.													
	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.													
Ins.														
41	151	159	167	175	183	191	199	207	215	223	230	238	246	254
42	159	168	176	185	193	201	210	218	227	235	243	252	260	269
43	166	174	183	192	200	209	218	227	236	244	253	262	270	279
44	176	185	194	204	213	222	231	241	250	259	268	278	287	296
45	180	190	199	209	218	228	237	247	256	266	275	286	294	304
46	188	198	208	218	228	238	248	258	268	278	288	297	307	317
47	197	207	217	228	238	248	259	269	279	290	300	310	321	331
48	205	216	227	238	248	260	270	281	292	302	313	324	335	346
49	213	225	236	247	258	270	281	292	303	314	326	337	348	359
50	222	234	246	257	269	281	292	304	316	328	339	351	363	374
51	231	243	256	268	280	292	304	315	329	341	353	365	377	389
52	241	253	266	278	291	304	316	329	342	354	367	380	392	405
53	250	263	276	289	302	316	329	341	355	368	381	395	408	421
54	259	273	287	300	314	328	341	355	369	382	396	410	423	437
55	269	283	297	312	326	340	354	368	382	397	411	425	439	453
56	279	294	309	323	338	353	367	382	397	411	426	441	455	470
57	289	304	320	335	350	365	381	396	411	426	442	457	472	487
58	300	315	331	347	363	379	394	410	426	442	457	473	489	505
59	310	327	343	359	376	392	408	425	441	457	474	490	506	523
60	321	338	355	372	389	406	422	439	456	473	490	507	524	541
61	332	350	368	385	403	420	438	455	473	490	508	525	543	560
62	344	362	380	398	416	434	452	470	488	506	524	542	561	579
63	355	373	392	411	429	448	467	485	504	523	541	560	579	597
64	367	387	406	425	445	464	483	503	522	541	561	580	599	619
65	378	398	418	438	458	478	498	518	538	558	578	597	617	637
66	391	412	432	453	473	494	515	535	556	576	597	617	638	659
67	402	423	445	466	487	508	529	550	572	593	614	635	656	677
68	415	437	459	480	502	524	546	568	590	611	633	655	677	699
69	429	452	474	497	519	542	565	587	610	632	655	677	700	723
70	442	465	488	512	535	558	581	605	628	651	674	698	721	744
71	454	478	502	526	550	574	598	622	646	670	694	717	741	765
72	469	493	518	543	567	592	617	641	666	691	715	740	765	789
73	483	508	534	559	585	610	635	661	686	712	737	762	788	813
74	497	523	550	576	602	628	654	680	707	733	759	785	811	837
75	511	538	565	592	619	646	673	700	727	754	781	807	834	861
76	526	553	581	609	636	664	692	719	747	775	802	830	858	885
77	540	568	597	625	654	682	710	739	767	796	824	852	881	909
78	556	585	614	644	673	702	731	761	790	819	848	878	907	936
79	572	602	632	662	692	722	752	782	812	842	872	902	933	963
80	587	618	649	680	711	742	773	804	835	866	897	927	958	989

TABLE 1.—SCRIBNER DECIMAL C LOG RULE—Continued.

6 TO 18 FOOT LOGS—Continued.

Diameter.	Length—feet.												
	6	7	8	9	10	11	12	13	14	15	16	17	18
	Contents—board feet in tens.												
Ins.													
81	190	222	254	286	317	349	381	413	444	476	508	540	572
82	196	228	261	293	326	358	391	424	456	489	521	554	586
83	201	234	268	301	335	368	401	434	468	501	535	568	601
84	206	240	275	309	343	378	412	446	481	515	549	584	618
85	210	246	281	316	351	386	421	456	491	526	561	596	631
86	215	251	287	323	359	395	431	467	503	539	575	611	646
87	221	258	295	332	368	405	442	479	516	553	589	626	663
88	226	264	301	339	377	414	452	490	527	565	603	640	678
89	231	270	308	347	385	424	462	501	539	578	616	655	693
90	236	275	315	354	393	433	472	511	551	590	629	669	708
91	241	282	322	362	402	443	483	523	563	604	644	684	725
92	246	288	329	370	411	452	493	534	575	616	657	698	740
93	251	293	335	377	419	461	503	545	587	629	671	713	755
94	257	300	343	386	428	471	514	557	600	643	685	728	771
95	262	306	350	394	437	481	525	569	612	656	700	744	788
96	268	313	357	402	446	491	536	581	625	670	715	759	804
97	273	319	364	410	455	501	546	592	637	683	728	774	819
98	278	325	371	418	464	511	557	603	650	696	743	789	836
99	284	331	379	426	473	521	568	615	663	710	757	805	852
100	289	338	386	434	482	531	579	627	675	724	772	820	869
101	295	344	393	443	492	541	590	639	688	738	787	836	885
102	301	351	401	452	502	552	602	652	702	753	803	853	903
103	307	358	409	461	512	563	614	665	716	768	819	870	921
104	313	365	417	470	522	574	626	678	730	783	835	887	939
105	319	372	425	479	532	585	638	691	744	798	851	904	957
106	325	379	433	488	542	596	650	704	758	813	867	921	975
107	331	387	442	497	553	608	663	718	773	829	884	939	995
108	337	394	450	506	563	619	675	731	788	844	900	956	1,013
109	344	401	459	516	573	631	688	745	803	860	917	975	1,032
110	350	408	467	525	583	642	700	758	817	875	933	992	1,050
111	356	416	475	535	594	654	713	772	832	891	951	1,010	1,070
112	362	423	483	544	604	665	725	785	846	906	967	1,027	1,088
113	369	431	492	554	615	677	738	800	861	923	984	1,046	1,107
114	375	438	501	563	626	688	751	814	876	939	1,001	1,064	1,127
115	382	446	509	573	637	700	764	828	891	955	1,019	1,082	1,146
116	389	454	519	584	648	713	778	843	908	973	1,037	1,102	1,167
117	396	462	528	594	660	726	792	858	924	990	1,056	1,122	1,188
118	403	470	537	605	672	739	806	873	940	1,008	1,075	1,142	1,209
119	410	478	547	615	683	752	820	888	957	1,025	1,093	1,162	1,230
120	417	487	556	626	695	765	834	904	973	1,043	1,112	1,182	1,251

TABLE 1.—SCRIBNER DECIMAL C LOG RULE—Continued.

19 TO 32 FOOT LOGS—Continued.

Diameter.	Length—feet.													
	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.													
Ins.														
81	603	635	667	699	730	762	794	826	857	889	921	953	984	1,016
82	619	652	684	717	749	782	815	847	880	912	945	977	1,010	1,043
83	635	668	702	735	769	802	835	869	902	936	969	1,002	1,036	1,069
84	652	687	721	755	790	824	858	893	927	961	996	1,030	1,064	1,099
85	667	702	737	772	807	842	877	912	947	982	1,017	1,052	1,088	1,123
86	682	718	754	790	826	862	898	934	970	1,006	1,042	1,077	1,113	1,149
87	700	737	774	810	847	884	921	958	995	1,081	1,068	1,105	1,142	1,179
88	716	753	791	829	866	904	942	979	1,017	1,055	1,092	1,130	1,168	1,205
89	732	770	809	847	886	924	963	1,001	1,040	1,078	1,117	1,155	1,194	1,232
90	747	787	826	865	905	944	983	1,023	1,062	1,101	1,141	1,180	1,219	1,259
91	765	805	845	886	926	966	1,006	1,047	1,087	1,127	1,167	1,208	1,248	1,288
92	781	822	863	904	945	986	1,027	1,068	1,109	1,150	1,191	1,233	1,274	1,315
93	796	838	880	922	964	1,006	1,048	1,090	1,132	1,174	1,216	1,258	1,299	1,341
94	814	857	900	942	985	1,028	1,071	1,114	1,157	1,199	1,242	1,285	1,328	1,371
95	831	875	919	963	1,006	1,050	1,094	1,138	1,181	1,225	1,269	1,313	1,356	1,400
96	849	893	938	983	1,027	1,072	1,117	1,161	1,206	1,251	1,295	1,340	1,385	1,429
97	865	910	956	1,001	1,047	1,092	1,138	1,183	1,229	1,274	1,320	1,365	1,411	1,456
98	882	928	975	1,021	1,068	1,114	1,160	1,207	1,253	1,300	1,346	1,392	1,439	1,485
99	899	947	994	1,041	1,089	1,136	1,183	1,231	1,278	1,325	1,373	1,420	1,467	1,515
100	917	965	1,013	1,062	1,110	1,158	1,206	1,255	1,303	1,351	1,399	1,448	1,496	1,544
101	934	983	1,033	1,082	1,131	1,180	1,229	1,278	1,328	1,377	1,426	1,475	1,524	1,573
102	953	1,003	1,054	1,104	1,154	1,204	1,254	1,304	1,355	1,405	1,455	1,505	1,555	1,605
103	972	1,023	1,075	1,126	1,177	1,228	1,279	1,330	1,382	1,433	1,484	1,535	1,586	1,637
104	991	1,043	1,096	1,148	1,200	1,252	1,304	1,356	1,409	1,461	1,513	1,565	1,617	1,669
105	1,010	1,063	1,117	1,170	1,223	1,276	1,329	1,382	1,436	1,489	1,542	1,595	1,648	1,701
106	1,029	1,083	1,138	1,192	1,246	1,300	1,354	1,408	1,463	1,517	1,571	1,625	1,679	1,733
107	1,050	1,105	1,160	1,216	1,271	1,326	1,381	1,437	1,492	1,547	1,602	1,658	1,713	1,768
108	1,069	1,125	1,181	1,238	1,294	1,350	1,406	1,463	1,519	1,575	1,631	1,688	1,744	1,800
109	1,089	1,147	1,204	1,261	1,319	1,376	1,433	1,491	1,548	1,605	1,663	1,720	1,777	1,835
110	1,108	1,167	1,225	1,283	1,342	1,400	1,458	1,517	1,575	1,633	1,692	1,750	1,808	1,867
111	1,129	1,188	1,248	1,307	1,367	1,426	1,485	1,545	1,604	1,664	1,723	1,783	1,842	1,901
112	1,148	1,208	1,269	1,329	1,390	1,450	1,510	1,571	1,631	1,692	1,752	1,813	1,873	1,933
113	1,169	1,230	1,292	1,353	1,415	1,476	1,538	1,599	1,661	1,722	1,784	1,845	1,907	1,968
114	1,189	1,252	1,314	1,377	1,439	1,502	1,565	1,627	1,690	1,752	1,815	1,878	1,940	2,003
115	1,210	1,273	1,337	1,401	1,464	1,528	1,592	1,655	1,719	1,783	1,846	1,910	1,974	2,037
116	1,232	1,297	1,362	1,426	1,491	1,556	1,621	1,686	1,751	1,815	1,880	1,945	2,010	2,075
117	1,254	1,320	1,386	1,452	1,518	1,584	1,650	1,716	1,782	1,848	1,914	1,980	2,046	2,112
118	1,276	1,343	1,411	1,478	1,545	1,612	1,679	1,746	1,814	1,881	1,948	2,015	2,082	2,149
119	1,298	1,367	1,435	1,503	1,572	1,640	1,708	1,777	1,845	1,913	1,982	2,050	2,118	2,187
120	1,321	1,390	1,460	1,529	1,599	1,668	1,738	1,807	1,877	1,946	2,016	2,085	2,155	2,224

TABLE 2.—CULL FOR RECTANGULAR DEFECTS.

[20 per cent deducted from kerf from solid board-foot contents.]

End dimensions.	Length of defect—feet.																												
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.																												
Inches.																													
2 x 3..	....	....	....	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4..	....	0.5	0.5	.5	.5	.5	.5	.5	.5	.5	.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
5..	0.5	.5	.5	.5	.5	.5	.5	.5	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
6..	.5	.5	.5	.5	.5	.5	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3
7..	.5	.5	.5	.5	.5	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
3 x 4..	.5	.5	.5	.5	.5	.5	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3
5..	.5	.5	.5	.5	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
6..	.5	.5	.5	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4
7..	.5	.5	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4
8..	.5	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5
9..	.5	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	6	6
10..	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6
11..	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6	6	6	7	7	7
x 5..	.5	.5	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	4	4	4	4
6..	.5	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5
7..	.5	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	6	6	6
8..	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6	6	6	7	7
9..	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	6	7	7	7	7	8
10..	1	1	2	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9
11..	1	1	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	9	9	9	9
12..	1	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10
13..	1	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10	11	11

5 x 6..	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6
7..	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	7
8..	1	1	2	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9
9..	1	2	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	8	9	9	9	10
10..	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10	11
11..	1	2	2	3	3	3	4	4	4	5	5	6	6	6	7	7	7	8	8	8	9	9	10	10	10	11	11	11	12
12..	2	2	2	3	3	4	4	4	5	5	6	6	6	7	7	8	8	8	9	9	10	10	10	11	11	12	12	12	13
13..	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11	12	12	13	13	13	14
14..	2	2	3	3	4	4	5	5	6	6	7	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	14	15
15..	2	2	3	4	4	4	5	6	6	6	7	8	8	8	9	10	10	10	11	12	12	12	13	14	14	14	15	16	16
16..	2	3	3	4	4	5	5	6	6	7	7	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	17	17
6 x 7..	1	1	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9
8..	1	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	9	10	10	10
9..	1	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11	12
10..	2	2	2	3	3	4	4	4	5	5	6	6	6	7	7	8	8	8	9	9	10	10	10	11	11	12	12	12	13
11..	2	2	3	3	4	4	4	5	5	6	6	7	7	7	8	8	9	9	10	10	11	11	11	12	12	13	13	14	14
12..	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	12	13	13	14	14	15	15
13..	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	14	14	15	15	16	16	17
14..	2	3	3	4	4	5	6	6	7	7	8	8	9	10	10	11	11	12	12	13	13	14	15	15	16	16	17	17	18
15..	2	3	3	4	4	5	5	6	7	7	8	8	9	10	10	11	11	12	13	13	14	14	15	16	16	17	17	18	19
16..	3	3	4	4	5	6	6	7	8	8	9	10	10	11	12	12	13	13	14	15	15	16	17	17	18	19	19	20	20
17..	3	3	4	5	5	6	7	7	8	9	10	10	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	22
18..	3	4	4	5	6	6	7	8	9	9	10	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	22	23
19..	3	4	5	5	6	7	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	21	21	22	23	24	24
20..	3	4	5	6	6	7	8	9	10	10	11	12	13	14	14	15	16	17	18	18	19	20	21	22	22	23	24	25	26
21..	3	4	5	6	7	8	8	9	10	11	12	13	13	14	15	16	17	18	18	19	20	21	22	23	24	24	25	26	27
22..	4	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18	18	19	20	21	22	23	24	25	26	26	27	28
7 x 8..	1	2	2	3	3	3	4	4	4	5	5	6	6	6	7	7	7	8	8	9	9	9	10	10	10	11	11	12	12
9..	2	2	3	3	4	4	4	5	5	5	6	6	7	7	8	8	8	9	9	10	10	10	11	11	12	12	13	13	13
10..	2	2	3	3	4	4	5	5	6	6	7	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	14	15
11..	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16
12..	2	3	3	4	4	5	6	6	7	7	8	8	9	10	10	11	11	12	12	13	13	14	15	15	16	16	17	17	18
13..	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	12	12	13	13	14	15	15	16	16	17	18	18	19	19
14..	3	3	4	5	5	6	7	7	8	8	9	10	10	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
15..	3	4	4	5	6	6	7	8	8	9	10	10	11	12	13	13	14	15	15	16	17	18	18	19	20	20	21	22	22
16..	3	4	4	5	6	7	7	8	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24
17..	3	4	5	6	6	7	8	9	10	10	11	12	13	13	14	15	16	17	17	18	19	20	21	21	22	23	24	25	25
18..	3	4	5	6	7	8	8	9	10	11	12	13	13	14	15	16	17	18	18	19	20	21	22	23	24	24	25	26	27
19..	4	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19	20	20	21	22	23	24	25	26	27	27	28
20..	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21	22	23	24	25	26	27	28	29	30

TABLE 2.—CULL FOR RECTANGULAR DEFECTS—Continued.

End dimensions.	Length of defect—feet.																												
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.																												
Inches.																													
7 x 21..	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31
22..	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	21	22	23	24	25	26	27	28	29	30	31	32	33
23..	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	20	21	23	24	25	26	27	28	29	30	31	32	33	34
24..	4	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	24	25	26	27	28	29	30	31	32	34	35	36
8 x 9..	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	12	13	13	14	14	15	15
10..	2	3	3	4	4	5	5	6	6	7	7	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	17	17
11..	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	13	14	15	15	16	16	17	18	18	19
12..	3	3	4	4	5	6	6	7	8	8	9	10	10	11	12	12	13	13	14	15	15	16	17	17	18	19	19	20	20
13..	3	3	4	5	6	6	7	8	8	9	10	10	11	12	12	13	14	15	15	16	17	17	18	19	19	20	21	21	22
14..	3	4	4	5	6	7	7	8	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24
15..	3	4	5	6	6	7	8	9	10	10	11	12	13	14	14	15	16	17	18	18	19	20	21	22	22	23	24	25	26
16..	3	4	5	6	7	8	9	9	10	11	12	13	14	15	15	16	17	18	19	20	20	21	22	23	24	25	26	26	27
17..	4	5	5	6	7	8	9	10	11	12	13	14	15	15	16	17	18	19	20	21	22	23	24	24	25	26	27	28	29
18..	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
19..	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
20..	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	25	26	27	28	29	30	31	32	33	34
21..	4	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	24	25	26	27	28	29	30	31	32	34	35	36
22..	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23	25	26	27	28	29	31	32	33	34	35	36	38
23..	5	6	7	9	10	11	12	13	15	16	17	18	20	21	22	23	25	26	27	28	29	31	32	33	34	36	37	38	39
24..	5	6	8	9	10	12	13	14	15	17	18	19	20	22	23	24	26	27	28	29	31	32	33	35	36	37	38	40	41
25..	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	25	27	28	29	31	32	33	35	36	37	39	40	41	43
26..	6	7	8	10	11	12	14	15	17	18	19	21	22	24	25	26	28	29	31	32	33	35	36	37	39	40	42	43	44
27..	6	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29	30	32	33	35	36	37	39	40	42	43	45	46
28..	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30	31	33	34	36	37	39	40	42	43	45	46	48
29..	6	8	9	11	12	14	15	17	19	20	22	23	25	26	28	29	31	32	34	36	37	39	40	42	43	45	46	48	49
30..	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32	34	35	37	38	40	42	43	45	46	48	50	51

9x10..	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	11	12	13	13	14	14	15	16	16	17	17	18	19	19
11..	3	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21
12..	3	4	4	5	6	6	7	8	9	9	10	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	22	23
13..	3	4	5	5	6	7	8	9	9	10	11	12	12	13	14	15	16	16	17	18	19	20	20	21	22	23	23	24	25
14..	3	4	5	6	7	8	8	9	10	11	12	13	13	14	15	16	17	18	18	19	20	21	22	23	24	24	25	26	27
15..	4	4	5	6	7	8	9	10	11	12	13	14	14	15	16	17	18	19	20	21	22	22	23	24	25	26	27	28	29
16..	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
17..	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	26	27	28	29	30	31	32	33
18..	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31	32	33	35
19..	5	6	7	8	9	10	11	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	30	31	32	33	34	35	36
20..	5	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24	25	26	28	29	30	31	32	34	35	36	37	38
21..	5	6	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25	26	28	29	30	32	33	34	35	37	38	39	40
22..	5	7	8	9	11	12	13	15	16	17	18	20	21	22	24	25	26	28	29	30	32	33	34	36	37	38	40	41	42
23..	6	7	8	10	11	12	14	15	17	18	19	21	22	23	25	26	28	29	30	32	33	34	36	37	39	40	41	43	44
24..	6	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29	30	32	33	35	36	37	39	40	42	43	45	46
25..	6	8	9	10	12	14	15	16	18	20	21	22	24	26	27	28	30	32	33	34	36	38	39	40	42	44	45	46	48
26..	6	8	9	11	12	14	16	17	19	20	22	23	25	27	28	30	31	33	34	36	37	39	41	42	44	45	47	48	50
27..	6	8	10	11	13	15	16	18	19	21	23	24	26	28	29	31	32	34	36	37	39	40	42	44	45	47	49	50	52
28..	7	8	10	12	13	15	17	18	20	22	24	25	27	29	30	32	34	35	37	39	40	42	44	45	47	49	50	52	54
29..	7	9	10	12	14	16	17	19	21	23	24	26	28	30	31	33	35	37	38	40	42	44	45	47	49	50	52	54	56
30..	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36	38	40	41	43	45	47	49	50	52	54	56	58
10x11..	3	4	4	5	6	7	7	8	9	10	10	11	12	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	23
12..	3	4	5	6	6	7	8	9	10	10	11	12	13	14	14	15	16	17	18	18	19	20	21	22	22	23	24	25	26
13..	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	16	17	18	19	20	21	22	23	23	24	25	26	27	28
14..	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21	22	23	24	25	26	27	28	29	30
15..	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16..	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	25	26	27	28	29	30	31	32	33	34
17..	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	22	23	24	25	26	27	28	29	31	32	33	34	35	36
18..	5	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24	25	26	28	29	30	31	32	34	35	36	37	38
19..	5	6	8	9	10	11	13	14	15	16	18	19	20	22	23	24	25	27	28	29	30	32	33	34	35	37	38	39	41
20..	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	25	27	28	29	31	32	33	35	36	37	39	40	41	43
21..	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	27	28	29	31	32	34	35	36	38	39	41	42	43	45
22..	6	7	9	10	12	13	15	16	18	19	21	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	45	47
23..	6	8	9	11	12	14	15	17	18	20	21	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	46	48	49
24..	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32	34	35	37	38	40	42	43	45	46	48	50	51
25..	7	8	10	12	13	15	17	18	20	22	23	25	27	28	30	32	33	35	37	38	40	42	43	45	47	48	50	52	53
26..	7	9	10	12	14	16	17	19	21	23	24	26	28	29	31	33	35	36	38	40	42	43	45	47	49	50	52	54	55
27..	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36	38	40	41	43	45	47	49	50	52	54	56	58
28..	7	9	11	13	15	17	19	21	22	24	26	28	30	32	34	35	37	39	41	43	45	47	49	50	52	54	56	58	60
29..	8	10	12	14	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	44	46	48	50	52	54	56	58	60	62
30..	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64

TABLE 2.—CULL FOR RECTANGULAR DEFECTS—Continued.

End dimensions.	Length of defect—feet.																													
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.																												
Inches.																													
11 x 12.	4	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18	18	19	20	21	22	23	24	25	26	26	27	28
13.	4	5	6	7	8	9	10	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
14.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	21	22	23	24	25	26	27	28	29	30	31	32	33
15.	4	6	7	8	9	10	11	12	13	14	15	16	18	19	20	21	22	23	24	25	26	28	29	30	31	32	33	34	35
16.	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23	25	26	27	28	29	31	32	33	34	35	36	38
17.	5	6	7	9	10	11	12	14	15	16	17	19	20	21	22	24	25	26	27	29	30	31	32	34	35	36	37	39	40
18.	5	7	8	9	11	12	13	15	16	17	18	20	21	22	24	25	26	28	29	30	32	33	34	36	37	38	40	41	42
19.	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	26	28	29	31	32	33	35	36	38	39	40	42	43	45
20.	6	7	9	10	12	13	15	16	18	19	21	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	45	47
21.	6	8	9	11	12	14	15	17	18	20	22	23	25	26	28	29	31	32	34	35	37	38	40	42	43	45	46	48	49
22.	6	8	10	11	13	15	16	18	19	21	23	24	26	27	29	31	32	34	35	37	39	40	42	44	45	47	48	50	52
23.	7	8	10	12	13	15	17	19	20	22	24	25	27	29	30	32	34	35	37	39	40	42	44	46	47	49	51	52	54
24.	7	9	11	12	14	16	18	19	21	23	25	26	28	30	32	33	35	37	39	40	42	44	46	48	49	51	53	55	56
25.	7	9	11	13	15	16	18	20	22	24	26	28	29	31	33	35	37	38	40	42	44	46	48	50	51	53	55	57	59
26.	8	10	11	13	15	17	19	21	23	25	27	29	31	32	34	36	38	40	42	44	46	48	50	51	53	55	57	59	61
27.	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	51	53	55	57	59	61	63
28.	8	10	12	14	16	18	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	60	62	64	66
29.	9	11	13	15	17	19	21	23	26	28	30	32	34	36	38	40	43	45	47	49	51	53	55	57	60	62	64	66	68
30.	9	11	13	15	18	20	22	24	26	29	31	33	35	37	40	42	44	46	48	51	53	55	57	59	62	64	66	68	70
12 x 13.	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
14.	4	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	24	25	26	27	28	29	30	31	32	34	35	36
15.	5	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24	25	26	28	29	30	31	32	34	35	36	37	38
16.	5	6	8	9	10	12	13	14	15	17	18	19	20	22	23	24	26	27	28	29	31	32	33	35	36	37	38	40	41
17.	5	7	8	10	11	12	14	15	16	18	19	20	22	23	24	26	27	29	30	31	33	34	35	37	38	39	41	42	44
18.	6	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29	30	32	33	35	36	37	39	40	42	43	45	46
19.	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30	32	33	35	36	38	40	41	43	44	46	47	49
20.	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32	34	35	37	38	40	42	43	45	46	48	50	51

21.	7	8	10	12	13	15	17	18	20	22	24	25	27	29	30	32	34	35	37	39	40	42	44	45	47	49	50	52	54
22.	7	9	11	12	14	16	18	19	21	23	25	26	28	30	32	33	35	37	39	40	42	44	46	48	49	51	53	55	56
23.	7	9	11	13	15	17	18	20	22	24	26	28	29	31	33	35	37	39	40	42	44	46	48	50	52	53	55	57	59
24.	8	10	12	13	15	17	19	21	23	25	27	29	31	33	35	36	38	40	42	44	46	48	50	52	54	56	58	60	61
25.	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
26.	8	10	12	15	17	19	21	23	25	27	29	31	33	35	37	40	42	44	46	48	50	52	54	56	58	60	62	64	67
27.	9	11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	43	45	48	50	52	54	56	58	60	63	65	67	69
28.	9	11	13	16	18	20	22	25	27	29	31	34	36	38	40	43	45	47	49	52	54	56	58	60	63	65	67	69	72
29.	9	12	14	16	19	21	23	26	28	30	32	35	37	39	42	44	46	49	51	53	56	58	60	63	65	67	70	72	74
30.	10	12	14	17	19	22	24	26	29	31	34	36	38	41	43	46	48	50	53	55	58	60	62	65	67	70	72	74	77
13 x 14.	5	6	7	8	10	11	12	13	15	16	17	18	19	21	22	23	24	25	27	28	29	30	32	33	34	35	36	38	39
15.	5	6	8	9	10	12	13	14	16	17	18	20	21	22	23	25	26	27	29	30	31	32	34	35	36	38	39	40	42
16.	6	7	8	10	11	12	14	15	17	18	19	21	22	24	25	26	28	29	31	32	33	35	36	37	39	40	42	43	44
17.	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	29	31	32	34	35	37	38	40	41	43	44	46	47
18.	6	8	9	11	12	14	16	17	19	20	22	23	25	27	28	30	31	33	34	36	37	39	41	42	44	45	47	48	50
19.	7	8	10	12	13	15	16	18	20	21	23	25	26	28	30	31	33	35	36	38	40	41	43	44	46	48	49	51	53
20.	7	9	10	12	14	16	17	19	21	23	24	26	28	29	31	33	35	36	38	40	42	43	45	47	49	50	52	54	55
21.	7	9	11	13	15	16	18	20	22	24	25	27	29	31	33	35	36	38	40	42	44	46	47	49	51	53	55	56	58
22.	8	10	11	13	15	17	19	21	23	25	27	29	31	32	34	36	38	40	42	44	46	48	50	51	53	55	57	59	61
23.	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
24.	8	10	12	15	17	19	21	23	25	27	29	31	33	35	37	40	42	44	46	48	50	52	54	56	58	60	62	64	67
25.	9	11	13	15	17	20	22	24	26	28	30	32	35	37	39	41	43	46	48	50	52	54	56	58	61	63	65	67	69
26.	9	11	14	16	18	20	23	25	27	29	32	34	36	38	41	43	45	47	50	52	54	56	59	61	63	65	68	70	72
27.	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47	49	51	54	56	58	61	63	66	68	70	73	75
28.	10	12	15	17	19	22	24	27	29	32	34	36	39	41	44	46	49	51	53	56	58	61	63	66	68	70	73	75	78
29.	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50	53	55	58	60	63	65	68	70	73	75	78	80
30.	10	13	16	18	21	23	26	29	31	34	36	39	42	44	47	49	52	55	57	60	62	65	68	70	73	75	78	81	83
14 x 15.	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	27	28	29	31	32	34	35	36	38	39	41	42	43	45
16.	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30	31	33	34	36	37	39	40	42	43	45	46	48
17.	6	8	10	11	13	14	16	17	19	21	22	24	25	27	29	30	32	33	35	36	38	40	41	43	44	46	48	49	51
18.	7	8	10	12	13	15	17	18	20	22	24	25	27	29	30	32	34	35	37	39	40	42	44	45	47	49	50	52	54
19.	7	9	11	12	14	16	18	20	21	23	25	27	28	30	32	34	35	37	39	41	43	44	46	48	50	51	53	55	57
20.	7	9	11	13	15	17	19	21	22	24	26	28	30	32	34	35	37	39	41	43	45	47	49	50	52	54	56	58	60
21.	8	10	12	14	16	18	20	22	24	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63
22.	8	10	12	14	16	18	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	60	62	64	66
23.	9	11	13	15	17	19	21	24	26	28	30	32	34	36	39	41	43	45	47	49	52	54	56	58	60	62	64	67	69
24.	9	11	13	16	18	20	22	25	27	29	31	34	36	38	40	43	45	47	49	52	54	56	58	60	63	65	67	69	72
25.	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47	49	51	54	56	58	61	63	65	68	70	72	75
26.	10	12	15	17	19	22	24	27	29	32	34	36	39	41	44	46	49	51	53	56	58	61	63	66	68	70	73	75	78
27.	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50	53	55	58	60	63	66	68	71	73	76	78	81

End dimensions.	Length of defect—feet.																												
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.																												
Inches.																													
14x28..	10	13	16	18	21	24	26	29	31	34	37	39	42	44	47	50	52	55	57	60	63	65	68	71	73	76	78	81	84
29..	11	14	16	19	22	24	27	30	32	25	38	41	43	46	49	51	54	57	60	62	65	68	70	73	76	78	81	84	87
30..	11	14	17	20	22	25	28	31	34	36	39	42	45	48	50	53	56	59	62	64	67	70	73	76	78	81	84	87	90
15x16..	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32	34	35	37	38	40	42	43	45	46	48	50	51
17..	7	8	10	12	14	15	17	19	20	22	24	26	27	29	31	32	34	36	37	39	41	42	44	46	48	49	51	53	54
18..	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36	38	40	41	43	45	47	49	50	52	54	56	58
19..	8	10	11	13	15	17	19	21	23	25	27	28	30	32	34	36	38	40	42	44	46	48	49	51	53	55	57	59	61
20..	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
21..	8	10	13	15	17	19	21	23	25	27	29	32	34	36	38	40	42	44	46	48	50	52	55	57	59	61	63	65	67
22..	9	11	13	15	18	20	22	24	26	29	31	33	35	37	40	42	44	46	48	51	53	55	57	59	62	64	66	68	70
23..	9	12	14	16	18	21	23	25	28	30	32	34	37	39	41	44	46	48	51	53	55	58	60	62	64	67	69	71	74
24..	10	12	14	17	19	22	24	26	29	31	34	36	38	41	43	46	48	50	53	55	58	60	62	65	67	70	72	74	77
25..	10	12	15	18	20	22	25	28	30	32	35	38	40	42	45	48	50	52	55	58	60	62	65	68	70	72	75	78	80
26..	10	13	16	18	21	23	26	29	31	34	36	39	42	44	47	49	52	55	57	60	62	65	68	70	73	75	78	81	83
27..	11	14	16	19	22	24	27	30	32	35	38	40	43	46	49	51	54	57	59	62	65	68	70	73	76	78	81	84	86
28..	11	14	17	20	22	25	28	31	34	36	39	42	45	48	50	53	56	59	62	64	67	70	73	76	78	81	84	87	90
29..	12	14	17	20	23	26	29	32	35	38	41	44	46	49	52	55	58	61	64	67	70	72	75	78	81	84	87	90	93
30..	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96
16x17..	7	9	11	13	15	16	18	20	22	24	25	27	29	31	33	34	36	38	40	42	44	45	47	49	51	53	54	56	58
18..	8	10	12	13	15	17	19	21	23	25	27	29	31	33	35	36	38	40	42	44	46	48	50	52	54	56	58	60	61
19..	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	39	41	43	45	47	49	51	53	55	57	59	61	63	65
20..	9	11	13	15	17	19	21	23	26	28	30	32	34	36	38	41	43	45	47	49	51	53	55	58	60	62	64	66	68
21..	9	11	13	16	18	20	22	25	27	29	31	34	36	38	40	43	45	47	49	52	54	56	58	60	63	65	67	69	72
22..	9	12	14	16	19	21	23	26	28	31	33	35	38	40	42	45	47	49	52	54	56	59	61	63	66	68	70	73	75
23..	10	12	15	17	20	22	25	27	29	32	34	37	39	42	44	47	49	52	54	56	59	61	64	66	69	71	74	76	79
24..	10	13	15	18	20	23	26	28	31	33	36	38	41	44	46	49	51	54	56	59	61	64	67	69	72	74	77	79	82

25..	11	13	16	19	21	24	27	29	32	35	37	40	43	45	48	51	53	56	59	61	64	67	69	72	75	77	80	83	85
26..	11	14	17	19	22	25	28	31	33	36	39	42	44	47	50	53	55	58	61	64	67	69	72	75	78	80	83	86	89
27..	12	14	17	20	23	26	29	32	35	37	40	43	46	49	52	55	58	60	63	66	69	72	75	78	81	84	86	89	92
28..	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96
29..	12	15	19	22	25	28	31	34	37	40	43	46	49	53	56	59	62	65	68	71	74	77	80	84	87	90	93	96	99
30..	13	16	19	22	26	29	32	35	38	42	45	48	51	54	58	61	64	67	70	74	77	80	83	86	90	93	96	99	102
17x18..	8	10	12	14	16	18	20	22	24	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65
19..	9	11	13	15	17	19	22	24	26	28	30	32	34	37	39	41	43	45	47	50	52	54	56	58	60	62	65	67	69
20..	9	11	14	16	18	20	23	25	27	29	32	34	36	39	41	43	45	48	50	52	54	57	59	61	63	66	68	70	73
21..	10	12	14	17	19	21	24	26	29	31	33	36	38	40	43	45	48	50	52	55	57	60	62	64	67	69	71	74	76
22..	10	12	15	17	20	22	25	27	30	32	35	37	40	42	45	47	50	52	55	57	60	62	65	67	70	72	75	77	80
23..	10	13	16	18	21	23	26	29	31	34	36	39	42	44	47	50	52	55	57	60	63	65	68	70	73	76	78	81	83
24..	11	14	16	19	22	24	27	30	33	35	38	41	44	46	49	52	54	57	60	63	65	68	71	73	76	79	82	84	87
25..	11	14	17	20	23	26	28	31	34	37	40	42	45	48	51	54	57	60	62	65	68	71	74	76	79	82	85	88	91
26..	12	15	18	21	24	27	29	32	35	38	41	44	47	50	53	56	59	62	65	68	71	74	77	80	83	85	88	91	94
27..	12	15	18	21	24	28	31	34	37	40	43	46	49	52	55	58	61	64	67	70	73	76	80	83	86	89	92	95	98
28..	13	16	19	22	25	29	32	35	38	41	44	48	51	54	57	60	63	67	70	73	76	79	83	86	89	92	95	98	102
29..	13	16	20	23	26	30	33	36	39	43	46	49	53	56	59	62	66	69	72	76	79	82	85	89	92	95	99	102	105
30..	14	17	20	24	27	31	34	37	41	44	48	51	54	58	61	65	68	71	75	78	82	85	88	92	95	99	102	105	109
18x19..	9	11	14	16	18	21	23	25	27	30	32	34	36	39	41	43	46	48	50	52	55	57	59	62	64	66	68	71	73
20..	10	12	14	17	19	22	24	26	29	31	34	36	38	41	43	46	48	50	53	55	58	60	62	65	67	70	72	74	77
21..	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50	53	55	58	60	63	66	68	71	73	76	78	81
22..	11	13	16	18	21	24	26	29	32	34	37	40	42	45	48	50	53	55	58	61	63	66	69	71	74	77	79	82	84
23..	11	14	17	19	22	25	28	30	33	36	39	41	44	47	50	52	55	58	61	63	66	69	72	75	77	80	83	86	88
24..	12	14	17	20	23	26	29	32	35	37	40	43	46	49	52	55	58	60	63	66	69	72	75	78	81	84	86	89	92
25..	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96
26..	12	16	19	22	25	28	31	34	37	41	44	47	50	53	56	59	62	66	69	72	75	78	81	84	87	90	94	97	100
27..	13	16	19	23	26	29	32	36	39	42	45	49	52	55	58	62	65	68	71	75	78	81	84	87	91	94	97	100	104
28..	13	17	20	24	27	30	34	37	40	44	47	50	54	57	60	64	67	71	74	77	81	84	87	91	94	97	101	104	108
29..	14	17	21	24	28	31	35	38	42	45	49	52	56	59	63	66	70	73	77	80	84	87	90	94	97	101	104	108	111
30..	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72	76	79	83	86	90	94	97	101	104	108	112	115
19x20..	10	13	15	18	20	23	25	28	30	33	35	38	41	43	46	48	51	53	56	58	61	63	66	68	71	73	76	79	81
21..	11	13	16	19	21	24	27	29	32	35	37	40	43	45	48	51	53	56	59	61	64	66	69	72	74	77	80	82	85
22..	11	14	17	20	22	25	28	31	33	36	39	42	45	47	50	53	56	59	61	64	67	70	72	75	78	81	84	86	89
23..	12	15	17	20	23	26	29	32	35	38	41	44	47	50	52	55	58	61	64	67	70	73	76	79	82	84	87	90	93
24..	12	15	18	21	24	27	30	33	36	40	43	46	49	52	55	58	61	64	67	70	73	76	79	82	85	88	91	94	97
25..	13	16	19	22	25	28	32	35	38	41	44	48	51	54	57	60	63	66	70	73	76	79	82	86	89	92	95	98	101
26..	13	16	20	23	26	30	33	36	40	43	46	49	53	56	59	63	66	69	72	76	79	82	86	89	92	96	99	102	105
27..	14	17	21	24	27	31	34	38	41	44	48	51	55	58	62	65	68	72	75	79	82	86	89	92	96	99	103	106	109

TABLE 2.—CULL FOR RECTANGULAR DEFECTS—Continued.

End dimensions.	Length of defect—feet.																												
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.																												
Inches.																													
19 x 28.	14	18	21	25	28	32	35	39	43	46	50	53	57	60	64	67	71	74	78	82	85	89	92	96	99	103	106	110	113
29.	15	18	22	26	29	33	37	40	44	48	51	55	59	62	66	70	73	77	81	84	88	92	96	99	103	107	110	114	118
30.	15	19	23	27	30	34	38	42	46	49	53	57	61	65	68	72	76	80	84	87	91	95	99	103	106	110	114	118	122
20 x 21.	11	14	17	20	22	25	28	31	34	36	39	42	45	48	50	53	56	59	62	64	67	70	73	76	78	81	84	87	90
22.	12	15	18	21	23	26	29	32	35	38	41	44	47	50	53	56	59	62	65	67	70	73	76	79	82	85	88	91	94
23.	12	15	18	21	25	28	31	34	37	40	43	46	49	52	55	58	61	64	67	71	74	77	80	83	86	89	92	95	98
24.	13	16	19	22	26	29	32	35	38	42	45	48	51	54	58	61	64	67	70	74	77	80	83	86	90	93	96	99	102
25.	13	17	20	23	27	30	33	37	40	43	47	50	53	57	60	63	67	70	73	77	80	83	87	90	93	97	100	103	107
26.	14	17	21	24	28	31	35	38	42	45	49	52	55	59	62	66	69	73	76	80	83	87	90	94	97	101	104	107	111
27.	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72	76	79	83	86	90	94	97	101	104	108	112	115
28.	15	19	22	26	30	34	37	41	45	49	52	56	60	63	67	71	75	78	82	86	90	93	97	101	105	108	112	116	119
29.	15	19	23	27	31	35	39	43	46	50	54	58	62	66	70	73	77	81	85	89	93	97	101	104	108	112	116	120	124
30.	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128
21 x 22.	12	15	18	22	25	28	31	34	37	40	43	46	49	52	55	59	62	65	68	71	74	77	80	83	86	89	92	95	99
23.	13	16	19	23	26	29	32	35	39	42	45	48	52	55	58	61	64	68	71	74	77	80	84	87	90	93	97	100	103
24.	13	17	20	24	27	30	34	37	40	44	47	50	54	57	60	64	67	71	74	77	81	84	87	91	94	97	101	104	108
25.	14	18	21	24	28	32	35	38	42	46	49	52	56	60	63	66	70	74	77	80	84	88	91	94	98	102	105	108	112
26.	15	18	22	25	29	33	36	40	44	47	51	55	58	62	66	69	73	76	80	84	87	91	95	98	102	106	109	113	116
27.	15	19	23	26	30	34	38	42	45	49	53	57	60	64	68	72	76	79	83	87	91	94	98	102	106	110	113	117	121
28.	16	20	24	27	31	35	39	43	47	51	55	59	63	67	71	74	78	82	86	90	94	98	102	106	110	114	118	122	125
29.	16	20	24	28	32	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93	97	102	106	110	114	118	122	126	130
30.	17	21	25	29	34	38	42	46	50	55	59	63	67	71	76	80	84	88	92	97	101	105	109	113	118	122	126	130	134
22 x 23.	13	17	20	24	27	30	34	37	40	44	47	51	54	57	61	64	67	71	74	78	81	84	88	91	94	98	101	105	108
24.	14	18	21	25	28	32	35	39	42	46	49	53	56	60	63	67	70	74	77	81	84	88	92	95	99	102	106	109	113
25.	15	18	22	26	29	33	37	40	44	48	51	55	59	62	66	70	73	77	81	84	88	92	95	99	103	106	110	114	117

26.	15	19	23	27	31	34	38	42	46	50	53	57	61	65	69	72	76	80	84	88	92	95	99	103	107	111	114	118	122
27.	16	20	24	28	32	36	40	44	48	51	55	59	63	67	71	75	79	83	87	91	95	99	103	107	111	115	119	123	127
28.	16	21	25	29	33	37	41	45	49	53	57	62	66	70	74	78	82	86	90	94	99	103	107	111	115	119	123	127	131
29.	17	21	26	30	34	38	43	47	51	55	60	64	68	72	77	81	85	89	94	98	102	106	111	115	119	123	128	132	136
30.	18	22	26	31	35	40	44	48	53	57	62	66	70	75	79	84	88	92	97	101	106	110	114	119	123	128	132	136	141
23 x 24.	15	18	22	26	29	33	37	40	44	48	52	55	59	63	66	70	74	77	81	85	88	92	96	99	103	107	110	114	118
25.	15	19	23	27	31	34	38	42	46	50	54	58	61	65	69	73	77	80	84	88	92	96	100	104	107	111	115	119	123
26.	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128
27.	17	21	25	29	33	37	41	46	50	54	58	62	66	70	75	79	83	87	91	95	99	104	108	112	116	120	124	128	132
28.	17	21	26	30	34	39	43	47	52	56	60	64	69	73	77	82	86	90	94	99	103	107	112	116	120	125	129	133	137
29.	18	22	27	31	36	40	44	49	53	58	62	67	71	76	80	84	89	93	98	102	107	111	116	120	125	129	133	138	142
30.	18	23	28	32	37	41	46	51	55	60	64	69	74	78	83	87	92	97	101	106	110	115	120	124	129	133	138	143	147
24 x 25.	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128
26.	17	21	25	29	33	37	42	46	50	54	58	62	67	71	75	79	83	87	92	96	100	104	108	112	116	121	125	129	133
27.	17	22	26	30	35	39	43	48	52	56	60	65	69	73	78	82	86	91	95	99	104	108	112	117	121	125	130	134	138
28.	18	22	27	31	36	40	45	49	54	58	63	67	72	76	81	85	90	94	99	103	108	112	116	121	125	130	134	139	143
29.	19	23	28	32	37	42	46	51	56	60	65	70	74	79	84	88	93	97	102	107	111	116	121	125	130	135	139	144	148
30.	19	24	29	34	38	43	48	53	58	62	67	72	77	82	86	91	96	101	106	110	115	120	125	130	134	139	144	149	154
25 x 26.	17	22	26	30	35	39	43	48	52	56	61	65	69	74	78	82	87	91	95	100	104	108	113	117	121	126	130	134	139
27.	18	22	27	32	36	40	45	50	54	58	63	68	72	76	81	86	90	94	99	104	108	112	117	122	126	130	135	140	144
28.	19	23	28	33	37	42	47	51	56	61	65	70	75	79	84	89	93	98	103	107	112	117	121	126	131	135	140	145	149
29.	19	24	29	34	39	44	48	53	58	63	68	72	77	82	87	92	97	102	106	111	116	121	126	130	135	140	145	150	155
30.	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160
26 x 27.	19	23	28	33	37	42	47	51	56	61	66	70	75	80	84	89	94	98	103	108	112	117	122	126	131	136	140	145	150
28.	19	24	29	34	39	44	49	53	58	63	68	73	78	83	87	92	97	102	107	112	116	121	126	131	136	141	146	150	155
29.	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	96	101	106	111	116	121	126	131	136	141	146	151	156	161
30.	21	26	31	36	42	47	52	57	62	68	73	78	83	88	94	99	104	109	114	120	125	130	135	140	146	151	156	161	166
27 x 28.	20	25	30	35	40	45	50	55	60	66	71	76	81	86	91	96	101	106	111	116	121	126	131	136	141	146	151	156	161
29.	21	26	31	37	42	47	52	57	63	68	73	78	84	89	94	99	104	110	115	120	125	130	136	141	146	151	157	162	167
30.	22	27	32	38	43	49	54	59	65	70	76	81	86	92	97	103	108	113	119	124	130	135	140	146	151	157	162	167	173
28 x 29.	22	27	32	38	43	49	54	60	65	70	76	81	87	92	97	103	108	114	119	125	130	135	141	146	152	157	162	168	173
30.	22	28	34	39	45	50	56	62	67	73	78	84	90	95	101	106	112	118	123	129	134	140	146	151	157	162	168	174	179
29 x 30.	23	29	35	41	46	52	58	64	70	75	81	87	93	99	104	110	116	122	128	133	139	145	151	157	162	168	174	180	186

TABLE 3.—CULL FOR SQUARED DEFECTS.

[20 per cent deducted for kerf from solid board-foot contents.]

End dimensions.	Length of defect—feet.													
	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Contents—board feet in tens.													
Inches.														
2x2	....	....	....	....	....	....	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
3x3	....	0.5	0.5	0.5	0.5	0.5	.5	.5	.5	1	1	1	1	1
4x4	0.5	.5	.5	1	1	1	1	1	1	1	1	2	2	2
5x5	.5	1	1	1	1	2	2	2	2	2	2	2	3	3
6x6	1	1	1	2	2	2	2	3	3	3	3	4	4	4
7x7	1	2	2	2	3	3	3	4	4	4	5	5	5	6
8x8	2	2	3	3	3	4	4	5	5	6	6	6	7	7
9x9	2	3	3	4	4	5	5	6	6	7	8	8	9	9
10x10	3	3	4	5	5	6	7	7	8	9	9	10	11	11
11x11	3	4	5	6	6	7	8	9	10	10	11	12	13	14
12x12	4	5	6	7	8	9	10	11	12	12	13	14	15	16
13x13	5	6	7	8	9	10	11	12	14	15	16	17	18	19
14x14	5	7	8	9	10	12	13	14	16	17	18	20	21	22
15x15	6	8	9	10	12	14	15	16	18	20	21	22	24	26
16x16	7	9	10	12	14	15	17	19	20	22	24	26	27	29
17x17	8	10	12	13	15	17	19	21	23	25	27	29	31	33
18x18	9	11	13	15	17	19	22	24	26	28	30	32	35	37
19x19	10	12	14	17	19	22	24	26	29	31	34	36	39	41
20x20	11	13	16	19	21	24	27	29	32	35	37	40	43	45
21x21	12	15	18	21	24	26	29	32	35	38	41	44	47	50
22x22	13	16	19	23	26	29	32	35	39	42	45	48	52	55
23x23	14	18	21	25	28	32	35	39	42	46	49	53	56	60
24x24	15	19	23	27	31	35	38	42	46	50	54	58	61	65
25x25	17	21	25	29	33	38	42	46	50	54	58	63	67	71
26x26	18	23	27	32	36	41	45	50	54	59	63	68	72	77
27x27	19	24	29	34	39	44	49	53	58	63	68	73	78	83
28x28	21	26	31	37	42	47	52	57	63	68	73	78	84	89
29x29	22	28	34	39	45	50	56	62	67	73	78	84	90	95
30x30	24	30	36	42	48	54	60	66	72	78	84	90	96	102

TABLE 3.—CULL FOR SQUARED DEFECTS—Continued.

[20 per cent deducted for kerf from solid board-foot contents.]

End dimensions.	Length of defect—feet.														
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Contents—board feet in tens.														
Inches.															
2x2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1
3x3	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
4x4	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
5x5	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5
6x6	4	5	5	5	5	6	6	6	6	6	7	7	7	7	8
7x7	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10
8x8	8	8	9	9	9	10	10	11	11	12	12	12	13	13	14
9x9	10	10	11	11	12	12	13	14	14	15	15	16	16	17	17
10x10	12	13	13	14	15	15	16	17	17	18	19	19	20	21	21
11x11	15	15	16	17	18	19	19	20	21	22	23	23	24	25	26
12x12	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
13x13	20	21	23	24	25	26	27	28	29	30	32	33	34	35	36
14x14	24	25	26	27	29	30	31	33	34	35	37	38	39	41	42
15x15	27	28	30	32	33	34	36	38	39	40	42	44	45	46	48
16x16	31	32	34	36	38	39	41	43	44	46	48	49	51	53	55
17x17	35	37	39	40	42	44	46	48	50	52	54	56	58	60	62
18x18	39	41	43	45	48	50	52	54	56	58	60	63	65	67	69
19x19	43	46	48	51	53	55	58	60	63	65	67	70	72	75	77
20x20	48	51	53	56	59	61	64	67	69	72	75	77	80	83	85
21x21	53	56	59	62	65	68	71	74	76	79	82	85	88	91	94
22x22	58	61	65	68	71	74	77	81	84	87	90	94	97	100	103
23x23	63	67	71	74	78	81	85	88	92	95	99	102	106	109	113
24x24	69	73	77	81	84	88	92	96	100	104	108	111	115	119	123
25x25	75	79	83	88	92	96	100	104	108	112	117	121	125	129	133
26x26	81	86	90	95	99	104	108	113	117	122	126	131	135	140	144
27x27	87	92	97	102	107	112	117	122	126	131	136	141	146	151	156
28x28	94	99	105	110	115	120	125	131	136	141	146	152	157	162	167
29x29	101	107	112	118	123	129	135	140	146	151	157	163	168	174	179
30x30	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192

TABLE 4.—SOLID CUBIC CONTENTS OF LOGS.

Length.	Average middle diameter (in inches).																	
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	(Contents (in cubic feet).																	
Feet.																		
4	0.25	0.25	0.5	1	1	1	2	2	3	3	4	4	5	6	6	7	8	9
5	.25	.5	.5	1	1	2	2	3	3	4	5	5	6	7	8	9	10	11
6	.25	.5	1	1	2	2	3	3	4	5	6	6	7	8	9	11	12	13
7	.25	.5	1	1	2	2	3	4	5	5	6	7	9	10	11	12	14	15
8	.5	.5	1	2	2	3	4	4	5	6	7	9	10	11	13	14	16	17
9	.5	1	1	2	2	3	4	5	6	7	8	10	11	13	14	16	18	20
10	.5	1	1	2	3	3	4	5	7	8	9	11	12	14	16	18	20	22
11	.5	1	1	2	3	4	5	6	7	9	10	12	13	15	17	19	22	24
12	.5	1	2	2	3	4	5	7	8	9	11	13	15	17	19	21	24	26
13	.5	1	2	3	3	5	6	7	9	10	12	14	16	18	20	23	26	28
14	.5	1	2	3	4	5	6	8	9	11	13	15	17	20	22	25	28	31
15	.5	1	2	3	4	5	7	8	10	12	14	16	18	21	24	27	30	33
16	1	1	2	3	4	6	7	9	11	13	15	17	20	22	25	28	32	35
17	1	1	2	3	5	6	8	9	11	13	16	18	21	24	27	30	33	37
18	1	2	2	4	5	6	8	10	12	14	17	19	22	25	28	32	35	39
19	1	2	3	4	5	7	8	10	13	15	18	20	23	27	30	34	37	41
20	1	2	3	4	5	7	9	11	13	16	18	21	25	28	32	35	39	44
21	1	2	3	4	6	7	9	11	14	16	19	22	26	29	33	37	41	46
22	1	2	3	4	6	8	10	12	15	17	20	24	27	31	35	39	43	48
23	1	2	3	5	6	8	10	13	15	18	21	25	28	32	36	41	45	50
24	1	2	3	5	6	8	11	13	16	19	22	26	29	34	38	42	47	52
25	1	2	3	5	7	9	11	14	16	20	23	27	31	35	39	44	49	55
26	....	....	...	5	7	9	11	14	17	20	24	28	32	36	41	46	51	57
27	....	....	...	5	7	9	12	15	18	21	25	29	33	38	43	48	53	59
28	....	....	...	5	7	10	12	15	18	22	26	30	34	39	44	49	55	61
29	....	....	...	6	8	10	13	16	19	23	27	31	36	40	46	51	57	63
30	....	....	...	6	8	10	13	16	20	24	28	32	37	42	47	53	59	65
31	....	....	...	6	8	11	14	17	20	24	29	33	38	43	49	55	61	68
32	....	....	...	6	9	11	14	17	21	25	29	34	39	45	50	57	63	70
33	....	....	...	6	9	12	15	18	22	26	30	35	40	46	52	58	65	72
34	....	....	...	7	9	12	15	19	22	27	31	36	42	47	54	60	67	74
35	....	....	...	7	9	12	15	19	23	27	32	37	43	49	55	62	69	76
36	....	....	...	7	10	13	16	20	24	28	33	38	44	50	57	64	71	79
37	....	....	...	7	10	13	16	20	24	29	34	40	45	52	58	65	73	81
38	....	....	...	7	10	13	17	21	25	30	35	41	47	53	60	67	75	83
39	....	....	...	8	10	14	17	21	26	31	36	42	48	54	61	69	77	85
40	....	....	...	8	11	14	18	22	26	31	37	43	49	56	63	71	79	87

TABLE 4.—SOLID CUBIC CONTENTS OF LOGS—Continued.

Length.	Average middle diameter (in inches).																		
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	Contents (in cubic feet).																			
Ft.																				
4	10	11	12	13	14	15	16	17	18	20	21	22	24	25	27	28	30	32	33	35
5	12	13	14	16	17	18	20	21	23	25	26	28	30	32	33	35	37	39	41	44
6	14	16	17	19	20	22	24	26	28	29	31	34	36	38	40	42	45	47	50	52
7	17	18	20	22	24	26	28	30	32	34	37	39	42	44	47	49	52	55	58	61
8	19	21	23	25	27	29	32	34	37	39	42	45	48	50	53	57	60	63	66	70
9	22	24	26	28	31	33	36	38	41	44	47	50	53	57	60	64	67	71	75	79
10	24	26	29	31	34	37	40	43	46	49	52	56	59	63	67	71	75	79	83	87
11	26	29	32	35	37	41	44	47	50	54	58	61	65	69	73	78	82	87	91	96
12	29	32	35	38	41	44	48	51	55	59	63	67	71	76	80	85	90	95	100	105
13	31	34	38	41	44	48	52	56	60	64	68	73	77	82	87	92	97	102	108	113
14	34	37	40	44	48	52	56	60	64	69	73	78	83	88	94	99	105	110	116	122
15	36	40	43	47	51	55	60	64	69	74	79	84	89	95	100	106	112	118	124	131
16	38	42	46	50	55	59	64	68	73	79	84	89	95	101	107	113	119	126	133	140
17	41	45	49	53	58	63	68	73	78	83	89	95	101	107	114	120	127	134	141	148
18	43	48	52	57	61	66	72	77	83	88	94	101	107	113	120	127	134	142	149	157
19	46	50	55	60	65	70	76	81	87	93	100	106	113	120	127	134	142	150	158	166
20	48	53	58	63	68	74	80	86	92	98	105	112	119	126	134	141	149	158	166	175
21	51	55	61	66	72	77	83	90	96	103	110	117	125	132	140	148	157	165	174	183
22	53	58	63	69	75	81	87	94	101	108	115	123	131	139	147	156	164	173	183	192
23	55	61	66	72	78	85	91	98	105	113	121	128	137	145	154	163	172	181	191	201
24	58	63	69	75	82	88	95	103	110	118	126	134	143	151	160	170	179	189	199	209
25	60	66	72	79	85	92	99	107	115	123	131	140	148	158	167	177	187	197	207	218
26	63	69	75	82	89	96	103	111	119	128	136	145	154	164	174	184	194	205	216	227
27	65	71	78	85	92	100	107	115	124	133	142	151	160	170	180	191	202	213	224	236
28	67	74	81	88	95	103	111	120	128	137	147	156	166	177	187	198	209	221	232	244
29	70	77	84	91	99	107	115	124	133	142	152	162	172	183	194	205	217	228	241	253
30	72	79	87	94	102	111	119	128	138	147	157	168	178	189	200	212	224	236	249	262
31	75	82	89	97	106	114	123	133	142	152	162	173	184	195	207	219	231	244	257	271
32	77	84	92	101	109	118	127	137	147	157	168	179	190	202	214	226	239	252	265	279
33	79	87	95	104	112	122	131	141	151	162	173	184	196	208	220	233	246	260	274	288
34	82	90	98	107	116	125	135	145	156	167	178	190	202	214	227	240	254	268	282	297
35	84	92	101	110	119	129	139	150	161	172	183	195	208	221	234	247	261	276	290	305
36	87	95	104	113	123	133	143	154	165	177	189	201	214	227	241	254	269	284	299	314
37	89	98	107	116	126	136	147	158	170	182	194	207	220	233	247	262	276	291	307	323
38	91	100	110	119	130	140	151	162	174	187	199	212	226	240	254	269	284	299	315	332
39	94	103	113	123	133	144	155	167	179	191	204	218	232	246	261	276	291	307	324	340
40	96	106	115	126	136	147	159	171	183	196	210	223	238	252	267	283	299	315	332	349

TABLE 4.—SOLID CUBIC CONTENTS OF LOGS—Continued.

Length.	Average middle diameter (in inches).																		
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	Contents (in cubic feet).																			
Ft.																				
4	37	38	40	42	44	46	48	50	52	55	57	59	61	64	66	68	71	73	76	79
5	46	48	50	53	55	58	60	63	65	68	71	74	77	80	82	86	89	92	95	98
6	55	58	61	63	66	69	72	75	79	82	85	88	92	95	99	103	106	110	114	118
7	64	67	71	74	77	81	84	88	92	95	99	103	107	111	115	120	124	128	133	137
8	73	77	81	84	88	92	96	101	105	109	113	118	123	127	132	137	142	147	152	157
9	83	87	91	95	99	104	108	113	118	123	128	133	138	143	148	154	159	165	171	177
10	92	96	101	106	110	115	120	126	131	136	142	147	153	159	165	171	177	183	190	196
11	101	106	111	116	121	127	133	138	144	150	156	162	169	175	181	88	195	202	209	216
12	110	115	121	127	133	138	145	151	157	164	170	177	184	191	198	205	213	220	228	236
13	119	125	131	137	144	150	157	163	170	177	184	192	199	207	214	222	230	239	247	255
14	128	135	141	148	155	162	169	176	183	191	199	206	214	223	231	239	248	257	266	275
15	138	144	151	158	166	173	181	188	196	205	213	221	230	239	247	257	266	275	285	295
16	147	154	161	169	177	185	193	201	210	218	227	236	245	254	264	274	284	294	304	314
17	156	164	171	180	188	196	205	214	223	232	241	251	260	270	280	291	301	312	323	334
18	165	173	182	190	199	208	217	226	236	245	255	265	276	286	297	308	319	330	342	353
19	174	183	192	201	210	219	229	239	249	259	270	280	291	302	313	325	337	349	361	373
20	183	192	202	211	221	231	241	251	262	273	284	295	306	318	330	342	354	367	380	393
21	193	202	212	222	232	242	253	264	275	286	298	310	322	334	346	359	372	385	399	412
22	202	212	222	232	243	254	265	276	288	300	312	324	337	350	363	376	390	404	418	432
23	211	221	232	243	254	265	277	289	301	314	326	339	352	366	379	393	408	422	437	452
24	220	231	242	253	265	277	289	302	314	327	340	354	368	382	396	411	425	440	456	471
25	229	241	252	264	276	289	301	314	327	341	355	369	383	398	412	428	443	459	475	491
26	238	250	262	275	287	300	313	327	340	355	369	383	398	414	429	445	461	477	494	511
27	248	260	272	285	298	312	325	339	354	368	383	398	414	429	445	462	478	495	513	530
28	257	269	282	296	309	323	337	352	367	382	397	413	429	445	462	479	496	514	532	550
29	266	279	292	306	320	335	349	364	380	395	411	428	444	461	478	496	514	532	551	569
30	275	289	303	317	331	346	361	377	393	409	426	442	460	477	495	513	532	550	570	589
31	284	298	313	327	342	358	373	390	406	423	440	457	475	493	511	530	549	569	589	609
32	293	308	323	338	353	369	386	402	419	636	454	472	490	509	528	547	567	587	608	628
33	303	317	333	348	364	381	398	415	432	550	468	487	506	525	544	564	585	605	627	648
34	312	327	343	359	376	392	410	427	445	464	482	501	521	541	561	582	603	624	646	668
35	321	337	353	370	387	404	422	440	458	477	497	516	536	557	577	599	620	642	665	687
36	330	346	363	380	398	415	434	452	471	491	511	531	552	573	594	616	638	661	683	707
37	339	356	373	391	409	427	446	465	485	505	525	546	567	588	610	633	656	679	702	726
38	348	366	383	401	420	439	458	478	498	518	539	560	582	604	627	650	673	697	721	746
39	358	375	393	412	431	450	470	490	511	532	553	575	598	620	643	667	691	716	740	766
40	367	385	403	422	442	462	482	503	524	545	567	590	613	636	660	684	709	734	759	785

TABLE 5.—BOARD FOOT CONTENTS OF STANDARD SIZES OF TIMBER.

End dimensions.	Length of timber—feet.							
	10	12	14	16	18	20	22	24
	Contents—board feet.							
Inches.								
1 x 2	1⅔	2	2⅓	2⅔	3	3⅓	3⅔	4
3	2½	3	3½	4	4½	5	5½	6
4	3⅓	4	4⅔	5⅓	6	6⅔	7⅓	8
5	4⅙	5	5⅚	6⅔	7½	8⅓	9⅙	10
6	5	6	7	8	9	10	11	12
7	5⅚	7	8⅙	9⅓	10½	11⅔	12⅚	14
8	6⅔	8	9⅓	10⅔	12	13⅓	14⅔	16
10	8⅓	10	11⅔	13⅓	15	16⅔	18⅓	20
12	10	12	14	16	18	20	22	24
14	11⅔	14	16⅓	18⅔	21	23⅓	25⅔	28
16	13⅓	16	18⅔	21⅓	24	26⅔	29⅓	32
18	15	18	21	24	27	30	33	36
20	16⅔	20	23⅓	26⅔	30	33⅓	36⅔	40
1¼ x 4	4⅓	5	5⅚	6⅔	7½	8⅓	9⅙	10
6	6½	7½	8¾	10	11¼	12½	13¾	15
8	8⅔	10	11⅔	13⅓	15	16⅔	18⅓	20
10	10⅚	12½	14 7/12	16⅔	18¾	20⅚	22 11/12	25
12	12½	15	17½	20	22½	25	27½	30
1½ x 4	5	6	7	8	9	10	11	12
6	7½	9	10½	12	13½	15	16½	18
8	10	12	14	16	18	20	22	24
10	12½	15	17½	20	22½	25	27½	30
12	15	18	21	24	27	30	33	36
2 x 3	5	6	7	8	9	10	11	12
4	6⅔	8	9⅓	10⅔	12	13⅓	14⅔	16
6	10	12	14	16	18	20	22	24
8	13⅓	16	18⅔	21⅓	24	26⅔	29⅓	32
10	16⅔	20	23⅓	26⅔	30	33⅓	36⅔	40
12	20	24	28	32	36	40	44	48
14	23⅓	28	32⅔	37⅓	42	46⅔	51⅓	56
16	26⅔	32	37⅓	42⅔	48	53⅓	58⅔	64
2½ x 12	25	30	35	40	45	50	55	60
14	29⅙	35	40⅚	46⅔	52½	58⅓	64⅙	70
16	33⅓	40	46⅔	53⅓	60	66⅔	73⅓	80
3 x 4	10	12	14	16	18	20	22	24
6	15	18	21	24	27	30	33	36
8	20	24	28	32	36	40	44	48
10	25	30	35	40	45	50	55	60
12	30	36	42	48	54	60	66	72
14	35	42	49	56	63	70	77	84
16	40	48	56	64	72	80	88	96
4 x 4	13⅓	16	18⅔	21⅓	24	26⅔	29⅓	32
6	20	24	28	32	36	40	44	48
8	26⅔	32	37⅓	42⅔	48	53⅓	58⅔	64
10	33⅓	40	46⅔	53⅓	60	66⅔	73⅓	80
12	40	48	56	64	72	80	88	96
14	46⅔	56	65⅓	74⅔	84	93⅓	102⅔	112

TABLE 5.—BOARD FOOT CONTENTS OF STANDARD SIZES OF TIMBER—Continued.

End dimensions.	Length of timber—feet.							
	10	12	14	16	18	20	22	24
	Contents—board feet.							
Inches.								
5 x 8	33⅓	40	46⅔	53⅓	60	66⅔	73⅓	80
6 x 6	30	36	42	48	54	60	66	72
8	40	48	56	64	72	80	88	96
10	50	60	70	80	90	100	110	120
12	60	72	84	96	108	120	132	144
14	70	84	98	112	126	140	154	168
16	80	96	112	128	144	160	176	192
8 x 8	53⅓	64	74⅔	85⅓	96	106⅔	117⅓	128
10	66⅔	80	93⅓	106⅔	120	133⅓	146⅔	160
12	80	96	112	128	144	160	176	192
14	93⅓	112	130⅔	149⅓	168	186⅔	205⅓	224
10 x 10	83⅓	100	116⅔	133⅓	150	166⅔	183⅓	200
12	100	120	140	160	180	200	220	240
14	116⅔	140	163⅓	186⅔	210	233⅓	256⅔	280
16	133⅓	160	186⅔	213⅓	240	266⅔	293⅓	320
12 x 12	120	144	168	192	216	240	264	288
14	140	168	196	224	252	280	308	336
16	160	192	224	256	288	320	352	384
14 x 14	163⅓	196	228⅔	261⅓	294	326⅔	359⅓	392
16	186⅔	224	261⅓	298⅔	336	373⅓	410⅔	448
18	210	252	294	336	378	420	462	504
16 x 16	213⅓	256	298⅔	341⅓	384	426⅔	469⅓	512
18	240	288	336	384	432	480	528	576
20	266⅔	320	373⅓	426⅔	480	533⅓	586⅔	640
18 x 18	270	324	378	432	486	540	594	648
20 x 20	333⅓	400	466⅔	533⅓	600	666⅔	733⅓	800
22 x 22	403⅓	484	564⅔	645⅓	726	806⅔	887⅓	968
24 x 24	480	576	672	768	864	960	1,056	1,152
26 x 26	563⅓	676	788⅔	901⅓	1,014	1,126⅔	1,239⅓	1,352
28 x 28	653⅓	784	914⅔	1,045⅓	1,176	1,306⅔	1,437⅓	1,568
30 x 30	750	900	1,050	1,200	1,350	1,500	1,650	1,800

TABLE 5.—BOARD FOOT CONTENTS OF STANDARD SIZES OF TIMBER—Continued.

End dimensions.	Length of timber—feet.					
	28	32	34	36	38	40
	Contents—board feet.					
Inches.						
8 x 8	149⅓	170⅔	181⅓	192	202⅔	213⅓
10	186⅔	213⅓	226⅔	240	253⅓	266⅔
12	224	256	272	288	304	320
14	261⅓	298⅔	317⅓	336	354⅔	373⅓
10 x 10	233⅓	266⅔	283⅓	300	316⅔	333⅓
12	280	320	340	360	380	400
14	326⅔	373⅓	396⅔	420	443⅓	466⅔
16	373⅓	426⅔	453⅓	480	506⅔	533⅓
12 x 12	336	384	408	432	456	480
14	392	448	476	504	532	560
16	448	512	544	576	608	640
14 x 14	457⅓	522⅔	555⅓	588	620⅔	653⅓
16	522⅔	597⅓	634⅔	672	709⅓	746⅔
18	588	672	714	756	798	840
16 x 16	597⅓	682⅔	725⅓	768	810⅔	853⅓
18	672	768	816	864	912	960
20	746⅔	853⅓	906⅔	960	1,013⅓	1,066⅔
18 x 18	756	864	918	972	1,026	1,080
20 x 20	933⅓	1,066⅔	1,133⅓	1,200	1,266⅔	1,333⅓
22 x 22	1,129⅓	1,290⅔	1,371⅓	1,452	1,532⅔	1,613⅓
24 x 24	1,344	1,536	1,632	1,728	1,824	1,920
26 x 26	1,577⅓	1,802⅔	1,915⅓	2,028	2,140⅔	2,253⅓
28 x 28	1,829⅓	2,090⅔	2,221⅓	2,352	2,482⅔	2,613⅓
30 x 30	2,100	2,400	2,550	2,700	2,850	3,000

The following converting equivalents are designed primarily for converting the quantity of timber cut or sold in other than saw timber form into the uniform unit of M feet b. m. used by the Service for statistical purposes. The adoption of uniform factors for this purpose is essential for convenience and ready computation. They have no further significance or value than as approximate equivalents in board measure of the material in each unit of product. They should only be used in appraisals and in scaling practice where it is impracticable to use a more direct method in arriving at the volume of the product.

TABLE 6.—STANDARD CONVERTING FACTORS.

Product.	Assumed dimensions.	Equivalent in board feet.
Long cord (acid wood, pulp wood, and distillation wood)	4′ x 5′ x 8′	625
Cord (spruce pulpwood)	4′ x 4′ x 8′	560
Cord (shingle bolts)	4′ x 4′ x 8′	600
Cord (fuel material averaging 5 inches or less in middle diameter)	4′ x 4′ x 8′	333⅓
Cord (fuel material averaging 6 inches or more in middle diameter)	4′ x 4′ x 8′	500
Load (in the rough)[1]	1 cord	333⅓
Pole (telephone)	7″ x 30′	60
Do	9″ x 30′	100
Pile	7″ x 30′	60
Stull	10″ x 16′	60
Tie (standard)	6″ x 8″ x 8′	30
Tie (2d class)	6″ x 7″ x 8′	20
Tie (narrow gauge)	6″ x 7″ x 6′	15
Do	7″ x 8″ x 6½′	25
Do	6″ x 7″ x 6½′	15
Tie	7″ x 8″ x 8′	30
Do	7″ x 9″ x 8′	35
Derrick pole	7″ x 30′	60
Derrick set (11 pieces)		480
Trestle timber	10″ x 20′	70
Do	7″ x 12′	20
House log	8″ x 16′	30
Do	7″ x 16′	30
Do	7″ x 10′	15
Mining timber	6″ x 10′	10
Prop	6″ x 10′	10
Converter pole	4″ x 20′	10
Pole (fence)	16′	8
Do	4″ x 20′	10
Lagging (6 pieces)	3″ x 6′	10
Cubic foot (round)		6
Rail (split)	½ pole	5
Piece	6″ x 7′	7
Stick	6″ x 7′	7
Slab	2″ x 6″ x 16′	2
Post	6″ x 7′	7
Post (circumference, 18 inches)	5.7″ x 7′	6
Post	5″ x 7′	5
Linear foot	10″ x 1′	3
Brace	4″ x 6′	2
Stay (fence)	2″ x 6′	½
Stay	4″ x 6′	2
Shake (roof)	⅜″ x 6″ x 2′	½
Shake (fruit tray)	1/16″ x 5″ x 32″	¼
Picket	3″ x 5′	1
Stake (fence)	3″ x 5′	1

[1] This refers to small irregular pieces of wood and not to material that can be ricked for measurement.

TABLE 7.—CONVERTING FACTORS—CHESTNUT TELEPHONE POLES.

[Based upon taper measurements.]

Top diameter inside bark.	Length of pole—feet.											
	20	25	30	35	40	45	50	55	60	65	70	75
	Contents—board feet in tens.											
Inches.												
5	1	3	4	6	8	10	13	16	20	25	31	39
6	2	4	6	8	10	13	16	20	25	31	39	48
7	4	5	7	10	13	16	20	25	31	39	47	58
8	5	7	9	12	16	20	25	31	38	47	56	67
9	....	....	11	15	19	25	30	38	46	55	65	77
10	....	....	13	18	24	30	37	45	54	63	75	89
11	....	....	....	....	....	....	45	52	62	72	85	101
12	....	....	....	....	....	....	53	61	71	82	96	114

TABLE 8.—AREAS OF CIRCLES.

Diameter.	Area.	Diameter.	Area.	Diameter.	Area.	Diameter.	Area.
Inches.	*Sq. ft.*	*Inches.*	*Sq. ft.*	*Inches.*	*Sq. ft.*	*Inches.*	*Sq. ft.*
1	0.01	21	2.41	41	9.17	61	20.29
2	.02	22	2.64	42	9.62	62	20.97
3	.05	23	2.89	43	10.08	63	21.65
4	.09	24	3.14	44	10.56	64	22.34
5	.14	25	3.41	45	11.04	65	23.04
6	.20	26	3.69	46	11.54	66	23.76
7	.27	27	3.98	47	12.05	67	24.48
8	.35	28	4.28	48	12.57	68	25.22
9	.44	29	4.59	49	13.10	69	25.97
10	.55	30	4.91	50	13.64	70	26.73
11	.66	31	5.24	51	14.19	71	27.49
12	.79	32	5.59	52	14.75	72	28.27
13	.92	33	5.94	53	15.32	73	29.07
14	1.07	34	6.31	54	15.90	74	29.87
15	1.23	35	6.68	55	16.50	75	30.68
16	1.40	36	7.07	56	17.10	76	31.50
17	1.58	37	7.47	57	17.72	77	32.34
18	1.77	38	7.88	58	18.35	78	33.18
19	1.97	39	8.30	59	18.99	79	34.04
20	2.18	40	8.73	60	19.63	80	34.91

TABLE 9.—TAPER.

[For scaling in maximum lengths of 16 feet.]

Total length.	Log lengths.			
	Butt log.	Second log.	Third log.	Top log.
Feet.				
18	10′	.....	.....	8′
Increase	1″	.....	.....	0″
20	10′	.....	.....	10′
Increase	1″	.....	.....	0″
22	12′	.....	.....	10′
Increase	1″	.....	.....	0″
24	12′	.....	.....	12′
Increase	1″	.....	.....	0″
26	14′	.....	.....	12′
Increase	1″	.....	.....	0″
28	14′	.....	.....	14′
Increase	2″	.....	.....	0″
30	16′	.....	.....	14′
Increase	2″	.....	.....	0″
32	16′	.....	.....	16′
Increase	2″	.....	.....	0″
34	12′	12′	.....	10′
Increase	3″	1″	.....	0″
36	12′	12′	.....	12′
Increase	3″	1″	.....	0″
38	14′	12′	.....	12′
Increase	3″	1″	.....	0″
40	16′	12′	.....	12′
Increase	3″	1″	.....	0″
42	16′	14′	.....	12′
Increase	3″	1″	.....	0″
44	16′	16′	.....	12′
Increase	3″	1″	.....	0″
46	16′	16′	.....	14′
Increase	4″	2″	.....	0″
48	16′	16′	.....	16′
Increase	4″	2″	.....	0″
50	14′	12′	12′	12′
Increase	4″	3″	1″	0″
52	16′	12′	12′	12′
Increase	4″	3″	1″	0″
54	16′	14′	12′	12′
Increase	5″	3″	1″	0″
56	16′	16′	12′	12′
Increase	5″	3″	1″	0″
58	16′	16′	14′	12′
Increase	5″	3″	2″	0″
60	16′	16′	14′	14′
Increase	5″	3″	2″	0″

This table is intended to be used simply as a guide; the allowances for taper shown in this table should be varied to conform to the *actual taper*.

TABLE 10.—TAPER.

[For scaling in maximum lengths of 32 feet.]

Total length.	Log lengths.			
	Butt log.	Second log.	Third log.	Top log.
Feet.				
34	18′			16′
Increase	2″			0″
36	18′			18′
Increase	2″			0″
38	20′			18′
Increase	2″			0″
40	20′			20′
Increase	2″			0″
42	22′			20′
Increase	2″			0″
44	22′			22′
Increase	2″			0″
46	24′			22′
Increase	2″			0″
48	24′			24′
Increase	3″			0″
50	26′			24′
Increase	3″			0″
52	26′			26′
Increase	3″			0″
54	28′			26′
Increase	3″			0″
56	28′			28′
Increase	3″			0″
58	30′			28′
Increase	4″			0″
60	30′			30′
Increase	4″			0″
62	32′			30′
Increase	4″			0″
64	32′			32′
Increase	4″			0″
66	22′	22′		22′
Increase	6″	4″		0″
68	24′	22′		22′
Increase	6″	4′		0′
70	24′	24′		22′
Increase	6″	4″		0″
72	24′	24′		24′
Increase	6″	4″		0″
74	26′	24′		24′
Increase	7″	5″		0″
76	26′	26′		24′
Increase	7″	5″		0″
78	26′	26′		26′
Increase	7″	5″		0″

TABLE 10.—TAPER—Continued.

Total length.	Log lengths.			
	Butt log.	Second log.	Third log.	Top log.
Feet.				
80	28′	26′	.....	26′
Increase	7″	5″	.....	0″
82	28′	28′	.....	26′
Increase	7″	5″	.....	0″
84	28′	28′	.....	28′
Increase	8″	5″	.....	0″
86	30′	28′	.....	28′
Increase	8″	5″	.....	0″
88	30′	30′	.....	28′
Increase	8″	5″	.....	0″
90	30′	30′	.....	30′
Increase	8″	6″	.....	0″
92	32′	30′	.....	30′
Increase	8″	6″	.....	0″
94	32′	32′	.....	30′
Increase	8″	6″	.....	6″
96	32′	32′	.....	32′
Increase	9″	6″	.....	0″
98	26′	24′	24′	24′
Increase	9″	8″	5″	0″
100	26′	26′	24′	24′
Increase	10″	8″	5″	0″

This table is intended to be used simply as a guide; the allowances for taper shown should be varied to conform to the actual taper. These figures are based on the actual taper of 110 Douglas fir trees of average height measured in Washington and Oregon.

SAMPLE PAGE 1—FORM

Purchaser, John Smith

Timber, Sale, 5-20-12 End Mark, None

SPECIES S—300 Western Yellow Pine

Log No.		Length.	Ft. B. M.		Log No.	Length	Ft. B. M.		Log No.	Length.	Ft. B. M.
50	1	16	40		21	12	35	5	41	14	60
	2	14	57		22	16	43		42	12	75
	3	12	53		23	16	24		43	16	53
	4	20	36		24	18	60		44	16	20
	5	16	(6) 12		25	14	cull		45	14	8
	6	14	cull		26	12	15		46	14	13
	7	16	6		27	16	(3) 37		47	12	cull
	8	16	(2) 9		28	14	54		48	20	98
	9	12	25		29	16	75		49	16	(12) 100
	10	14	57		30	16	87		50	18	49
	11	16	(11) 60		31	14	18		51	14	57
	12	16	92		32	14	10		52	12	23
	13	14	10		33	12	10		53	16	10
	14	14	12		34	10	cull		54	16	12
	15	12	10		35	16	28		55	16	55
	16	14	(4) 20		36	20	30		56	16	30
	17	16	18		37	14	(7) 50		57	10	65
	18	16	21		38	12	42		58	14	46
	19	16	24		39	16	64		59	12	25
	20	18	cull		40	16	75		60	14	18
			562				757				817

5620 7570 8170

Scaled by Chas Brown F.R.

231—SAW TIMBER.

Where Scaled, At railroad landing No. 3. 6

Compartment, 2 ; *Sec.,* 25 ; *T.,* 5 ; *R.,* 4E ; *Date* 9-15 1902

SPECIES
5—380

Log No.	Length	Ft. B. M.	Log No.	Length	Ft. B. M.	REMARKS.
5 61	16	37	5 81	12	15	Other Species
62	16	59	82	14	18	are recorded
63	12	21	83	18	46	on other pages
64	16	16	84	16	(7) 78	or in other
65	14	35	85	16	39	books.
66	18	(5) 67	86	14	cull	
67	18	95	87	20	105	
68	12	41	88	12	27	
69	12	9	89	12	50	
70	14	10	90	16	cull	
71	16	cull	91	16	53	
72	16	74	92	16	10	
73	14	49	93	14	17	
74	14	(9) 57	94	16	29	
75	20	24	95	12	8	
76	16	6	96	16	(10) 56	
77	16	30	97	14	49	
78	14	89	98	16	60	
79	12	57	99	16	cull	
80	12	(4) 36	00	14	36	
		812			696	

TOTAL, THIS PAGE.	8120 6960
BROUGHT FORWARD.	36440
TOTAL SINCE LAST REPORT.	110750
REPORTED TO 9/1/12	147190
TOTAL TO 9/15/12	707610

SAMPLE PAGE 2—FORM

PURCHASER John Brown

TIMBER SALE 9/1/08

SPECIES	W. Pine	Larch	Cedar	D. Fir	SPECIES	W. Pine	Larch	Cedar	D. Fir	SPECIES	W. Pine
LOG No. / LENGTH	Ft. B M				LOG No. / LENGTH	Ft. B M				LOG No. / LENGTH	Ft.
1 16	10				26 16	10				51 16	18
2 14		12			27 14				16	52 16	10
3 16	18				28 16			7		53 14	
4 16			21		29 16			21		54 16	
5 12				44	30 16	50				55 16	
6 14	19				31 14				51	56 14	16
7 18				54	32 16		18			57 16	
8 16		33			33 16	40				58 16	
9 12	12				34 12			18		59 18	
10 16		10			35 16	173				60 14	6
11 16			30		36 14		3			61 16	71
12 14	103				37 18				54	62 16	
13 16				14	38 16	33				63 14	
14 18			54		39 16	28				64 16	11
15 16		16			40 12	3				65 16	18
16 20				23	41 18			10		66 14	
17 16	50				42 16		18			67 16	
18 14	27				43 16				3	68 16	10
19 12			3		44 14			19		69 14	4
20 16				7	45 16	92				70 16	92
21 16			14		46 12		12			71 16	
22 16	3				47 16	3				72 14	19
23 14		2			48 16			48		73 16	3
24 16	21				49 14		12			74 14	
25 16				3	50 16				33	75 16	48

TOTAL BY SPECIES	W. Pine	Larch	Cedar	D. Fir
	2690	790	1260	1450
	4920	700	1160	1510
	8920			

231-D1—SAW TIMBER.

SEC 20 T. 58 N R 4 W. DATE 9/12 1910
SCALER Ralph Smart 4

Larch B	Cedar M	D.Fir M	SPECIES LOG No.	SPECIES Diam.	W.Pine Ft	Larch B	Cedar M	D.Fir M
			76	16	19			
			77	16		21		
41			78	16				40
		68	79	18			23	
	50		80	16	8			
			81	16	10			
14			82	16		33		
		10	83	14				14
	33		84	14				3
			85	16		7		
			86	18	12			
		8	87	16		8		
41			88	16			18	
			89	14		10		
			90	12			2	
10			91	16	48			
	14		92	14				14
			93	16	24			
			94	16	24			
			95	16		16		
		33	96	14				21
			97	16	7			
			98	16		10		
14			99	16	18			
			100	16		4		
		1170						920
	1110						430	
1060						1090		
					2190			

REMARKS ON PAGE

NO. PCS BY SPECIES

	TOTAL THIS PAGE	BROUGHT FORWARD	TOTAL SINCE LAST REPORT	REPORTED TO 9/5/10	TOTAL TO 9/12/10
D. FIR	20	50	70	25	95
CEDAR	17	49	66	25	91
LARCH	23	201	224	50	274
W. PINE	40	400	440	100	540

	TOTAL THIS PAGE	BROUGHT FORWARD	TOTAL SINCE LAST REPORT	REPORTED TO 9/5/10	TOTAL TO 9/12/10
	5110	11140	66250	7400	23650
	3920	10000	13920	5000	18920
	3550	35640	39220	29010	68230
	12360	100730	113090	10000	123090

SAMPLE PAGE 3—FORM

Purchaser Snoqualmie Logging Co.

Compartment ____ Sec. 23 Twp. 31 R 9E W.M.

Log No	Length Feet	Diameter Inches	Taper	CONTENTS BY SPECIES					Defects, Kind, Amount Deducted, Overlengths
				Doug Fir	Hemlock	Cedar	Dead Doug. Fir		
2561	16					15			S1 (Slab)
2	16					18			S1
3	40					24			S1
4	40					20			S1
5	32	27			96				14S (Shake)
6	32					42			S1
7	40	15	1		34				4C (Conk.)
8	40	21	1		74				6-S
9	40	38	1				138		60-PK (Punk or Sap rot)
70	34	32					131		30-PR (Pitch ring)
1	40	30	1		166				6S
2	40	30	1	Cull					172C
3	32	22			67				
4	26	20			45				
5	40	33	2			177			30R (Center rot)
6	26	20				45			
7	28	35		93					60C
8	40	14			24				8ChS
9	32	14			18				5ChS
80	40	51	1	456					40-PS (Pitch seam)
TOTALS-SPECIES 3	11	Doug. Fir		5.46					
	17	Hemlock			5.24				
	8	Cedar				3.33			
		Dead Doug. Fir					2.69		

651—SAW TIMBER.

Timber Sale 6-4-10 Brand U.S. SL

Where Scaled At Landing Date 10-31 11-1-'12

Log No.	Length Feet	Diameter Inches	Taper	Contents by Species: Doug. Fir	Hemlock	Cedar	Deed Douglas Fir		Defects, Kind Amount Deducted, Overlengths
2581	32	54		407					30PR
2	40	49	2	448					20PS
3	40	46	1	393					12PS
4	40	50	2	471					16PS
5	36	47	2	343					45GR(Ground Rot)
6	40	53	2	510					36PS
7	40	45	1	388					
8	32	40		232					9PS
9	40	17	1		46				4S
90	32	15			26				2S
1	38	11	1		17				
2	40	12	1			19			3B
3	34	20	1		56				5S
4	38	29	1	146					4PS
5	40	14	1		32				
6	32	16			32				
7	40	20			73				
8	40	34	1				165		44Pk
9	32	14			23				
2600	32	13			19				
				33.38					38.07
					3.24				8.49
						.19			3.52
							.5		4.34

Totals for page

Transferred to Journal Page 1.125

Scaled by John Doe Scaler

SAMPLE PAGE 4—FORM 651—SAW

Purchaser Snoqualmie Logging Co

Scaled by John Doe

Page	Douglas Fir	Hemlock	Cedar	Dead Douglas Fir	Dead Cedar
1.	1.05	394	2214	876	129
2.	1964	1537	1175	1208	80
3.	2572	1266	985	374	142
4.	1876	780	1343	1163	
5.	2432	338	1334		457
Totals 11/12	8949	4915	7051	3621	808

TIMBER, SUMMARY SHEET.

101

Timber Sale _Number_of_Pieces_ _ _ _

	Page	Douglas Fir	Hemlock	Cedar	Dead Douglas Fir	Dead Cedar
	1.	1	4	14	6	4
	2.	5	16	9	8	2
	3.	8	7	20	7	5
	4.	12	10	5	7	
	5.	20	10	1		19
	Totals	46	47	49	28	30

SAMPLE PAGE 5—FORM 231—

Purchaser, THE PACIFIC PULP CO.

Timber Sale, 9/4/12 - Tongass *End Mark,*

SPECIES 390 Western Hemlock

Log No.	Length. D-L	Ft. B. M. Cu Ft	Log No.	Length.	Ft. B. M.	Log No.	Length.	Ft. B. M.
1	8-20	7	21			41		
2	6-16	3	22			42		
3	20-18	39	23			43		
4	34-40	252	24			44		
5	40-40	(44) 300	25			45		
6	24-30	cull	26			46		
7	38-26	205	27			47		
8	45-14	155	28			48		
9	36-34	240	29			49		
10	23-40	115	30			50		
11	36-40 20-40	370	31			51		
12	8-30	10	32			52		
13	8-24	cull	33			53		
14	25-30	(11) 100	34			54		
15	11-36	24	35			55		
16	23-38	110	36			56		
17	29-23	105	37			57		
18	10-36	200	38			58		
19	23-40	115	39			59		
20	25-30	102	40			60		
		2452						

TOTALS. ~7.24 cords

Scaled by James Downes
F.R

CUBIC FEET AND CORDS.

Where Scaied, ...IN...RAFT 5

Compartment..... : *Sec*..... : *T*..... ; *R*..... ; *Date*..7/4 . 1914

SPECIES
7—380

Log No.	Length.	Ft. B. M	Log No.	Length.	Ft. B. M.	REMARKS
61			81			90 Cu. Ft. solid equivalent to one cord.
62			82			
63			83			
64			84			
65			85			
66			86			
67			87			
68			88			
69			89			
70			90			
71			91			
72			92			
73			93			
74			94			
75			95			
76			96			
77			97			
78			98			
79			99			
80			00			

TOTAL, THIS PAGE. 27.24

BROUGHT FORWARD. 125.36

TOTAL SINCE LAST REPORT. 152.60

REPORTED TO ....6/4/14..... 264.20

TOTAL TO ....7/4/14..... 416.80

SAMPLE PAGE 6—FORM

S. PIKE (Forest) Sales

John Doe (Purchaser) Jan. 15, 1914 (Date)

Species Material	Cordwood—Mixed Species				
Date Scaled	No. Pieces	No. Pieces	No. Pieces	No. Pieces	No. Pieces
	No. Rick	Height	Length	Width	Cords
Mar. 15	5	4.5	40	4	5.6
" "	6	4.	40	4	5.
" "	7	3.5	32	4	3.5
" "	8	4	50	4	6.25

Remarks on

Page .....

Item .....

No. Pieces	Linear Feet	
		20.35

648—CORD MEASUREMENT.

Compartment _____ Scaler, John Clark

Sec. 23, T. 4N, R. 6W, _____ (Where scaled)

No. Pieces	No. Pieces	Linear Feet	Grand Totals	Railroad Ties	Miscellaneous	Miscellaneous
			Total this page	Cords	20.35	
			Brought forward	"	40.50	
			Total since last report		60.85	
			Reported to Mar. 1		100.15	
			Total to Mar. 15		161.00	

SAMPLE PAGE 7—FORM

Purchaser, John Doe; Aug. 10/10

Compartment, ____; Sec., 6, Twp., 14 N.; R., 7 W.

8—854

Log No.	Length, Feet.	Diameter, Inches.	Taper.	Contents by Species. Doug. Fir.	Hemlock.	Cedar.			Defects, Kind, Amount Deducted, Overlengths.
				Forward from page 43					
Scale report No. 120				Bolts running the same number per cord are entered separately under "Pieces". The number of even cords and of odd bolts from each lot are then entered under "Cords" and "Bolts". All of these entries are totaled. The total of odd bolts is converted into cords by an average figure, and addition made to the total under "Cords."					
Totals—Species.		Doug. Fir.							
		Hemlock.							
		Cedar.		Total this page					
				Forward to page 87					

651—SHINGLE BOLTS.

Timber Sale, Dead 52" *Brand,* .....

Where Scaled, Block 3 ; *Date,* Jan 1/13

8—854

Log No.	Length, Feet.	Diameter, Inches.	Taper.	Contents by Species. Doug. Fir.	Hemlock.	Cedar.			Defects, Kind, Amount Deducted, Overlengths.
Pieces						Cords		Bolts	
	12							12	
1	50	@		21		7		3	
	22			22		1			
1	52			23		6		14	
The odd bolts left are carried over to the next page. This number is deducted from the total under "Pieces" leaving in that total only what has been converted into cords. Bolts of different length and bolts cut from green and dead timber should be recorded on separate pages.									
336						14		29	AV 22
7						1		22	
329						15		7	Page.
329						15			Totals for Page.
7								7	

Transferred to Journal, Page .....

Scaled by— A. B. Cole

SAMPLE PAGE 8—FORM

Purchaser, John Doe

Timber Sale, 7-1-14 Lolo *End Mark,*

SPECIES Cedar Poles

Log No	Length and Diameter Ft.-In.	Ft. B. M.	Log No	Length and Diameter	Ft. B. M.	Log No.	Length and Diameter	Ft. B. M.
1	40-8		21			41		
2	25-6		22			42		
3	25-6		23			43		
4	25-7		24			44		
5	30-6		25			45		
6	45-8		26			46		
7	40-8		27			47		
8	25-7		28			48		
9	55-8		29			49		
10	50-8		30			50		
11	45-8		31			51		
12	25-7		32			52		
13	40-8		33			53		
14	25-7		34			54		
15	50-8		35			55		
16	25-7		36			56		
17	40-8		37			57		
18	30-6		38			58		
19	50-8		39			59		
20	25-6		40			60		

TOTALS.

Scaled by Richard Roe

A.L.R

231—TELEPHONE POLES.

Where Scaled, In Woods 8

Compartment, ; *Sec.,* 21 ; *T.* 15 ; *R.* 20W ; *Date,* 9/26, 1904

SPECIES

8—280

Log No.	Length and Diameter	Ft. B. M.	Log No.	Length and Diameter	Ft. B. M.	Remarks.
61			81			
62			82			
63			83			
64			84			
65			85			
66			86			
67			87			
68			88			
69			89			
70			90			
71			91			
72			92			
73			93			
74			94			
75			95			
76			96			
77			97			
78			98			
79			99			
80			00			TOTAL PIECES

Ft.-In.	20-5	20-6	25-6	25-7	30-6	30-7	30-8	35-7	35-8	40-7	40-8	45-7	45-8	50-8	55-8	60-8	65-8	70-8	75-8	
Total Since Last Report	3	5	13	30	16	2	1	2		6	24	1	8	4	1		3		1	120
Number Brought Forward	3	5	10	25	14	2	1	2		6	20	1	6	1			3		1	100
Number This Page			3	5	2						4		2	3	1					20

SAMPLE PAGE 9—FORM

PURCHASER. John Brown

TIMBER SALE. 9/1/08

SPECIES		Poles 25 to 35	Poles 40 to 60	Poles 65 to 80	Piling	SPECIES		Poles 25 to 35	Poles 40 to 60	Poles 65 to 80	Piling	SPECIES		Poles 25 to 35
LOG No.	LENGTH	LINEAR FT.				LOG No.	LENGTH	LINEAR FT.				LOG No.	LENGTH	LIN
1		25				26		30				51		30
2					30	27			60			52		30
3			40			28		25			30	53		
4		35				29					35	54		
5		30				30				65		55		
6				65		31				20		56		
7		25				32		35				57		
8			40			33		25				58		25
9		30				34			50			59		30
10		25				35			50			60		25
11		35				36			55			61		35
12					40	37		30				62		
13				70		38				80		63		
14		25				39					40	64		
15		35				40		30				65		30
16		35				41			30			66		30
17						42			50			67		30
18					45	43		30				68		
19			60			44		30				69		
20		30				45		30				70		
21		25				46			60			71		
22					45	47				25		72		
23				90		48		30				73		
24					60	49		25				74		
25		30				50					40	75		30
TOTAL BY SPECIES	PILING				220						140			
	65' AND			215						200				
	40' to 60'		180						325					
	POLES 25' to 35'	285						325						295

231-D1—LINEAR FEET.

SEC. 20 T 56 N R 3 E DATE 9/12 1910
SCALER Ralph Smart 6

Poles 40 to 60	Poles 65 to 80	Piling	SPECIES	LOG No.	8"	15 to 35	Poles 40 to 60	Poles 65 to 80	Piling	REMARKS ON PAGE
EAR	FT.					LINEAR FT.				
				76			60			
				77			40			
40				78			50			
	65			79		50				
	70			80		30				
40				81				70		
		36		82				65		
				83					40	
				84					20	
				85					30	
				86					30	
43				87				60		
43				88			40			
50				89		30				
				90		25				
				91		30				
				92			50			
50				93			50			
	70			94			50			
		30		95			50			
		30		96				65		
		30		97		30				
		30		98		30				
		30		99		30				
				100					30	
		185							100	
	205							260		
275							300			
						285				

NO. PCS BY SPECIES

	Piling	25 to 35	40 to 60	65 to 80		
TOTAL THIS PAGE	20	45	25	14	43	43
BROUGHT FORWARD	24	100	50	26	50	50
TOTAL SINCE LAST REPORT	44	145	75	40	93	93
REPORTED TO 9/5/10	50	400	200	50	200	200
TOTAL TO 9/12/10	94	545	275	90	293	293

TOTAL THIS PAGE	200	800	1500	2000	3500	
BROUGHT FORWARD	970	1600	2270	3000	5270	
TOTAL SINCE LAST REPORT	1170	2400	3770	5000	8770	
REPORTED TO 9/5/10	1260	1500	2260	5000	7260	
TOTAL TO 9/12/10	2430	3900	6030	10000	16030	

SAMPLE PAGE 10—FORM 648—

S. UINTA (Forest) Sales

J. C. Brown & Co. (Purchaser) Nov. 10, 1913 (Date)

Species: Green Lodge-Pole Pine

Material	8 Ft Props		10 Ft. Props		12 Ft. Props		14 Ft. Props		16 Ft. Props	
Date Scaled		No. Pieces		No. Pieces		No. Pieces		No. Pieces		No. Pieces
Dec. 15, '13	(3)	40	(0)	32	(17)	26	(22)	14	(31)	43
	(4)	66	(1)	44	(18)	38			(32)	57
	(5)	92	(12)	61	(19)	43	(23)	24	(33)	75
Dec 20, '13	(4)	59	(10)	34	(20)	62	(23)	18	(31)	62
	(6)	214	(11)	156	(19)	79	(22)	42	(32)	186
Dec. 28 '13	(7)	143	(12)	102	(18)	68	(21)	27	(31)	116
	(3)	72	(13)	64	(17)	48	(22)	23	(32)	63

Figures in ( ) indicate serial nos.

Remarks on Page 20 Item (c)

No. Pieces	Linear Feet
686	5488
493	4930
364	4368
148	2072
602	9632

PROPS, TIES, AND POSTS.

Compartment 11, Scaler, G. B. Harding

Sec. 18, T. 2 N., R. 11 E., Mill Cr. Landings (Where scaled)

18 Ft. Props No. Pieces		Ry. Ties Firsts		Ry. Ties Seconds		Posts Number	
		(50)	84	(62)	12	(70)	21
(40)	12	(51)	124	(63)	20	(71)	36
(41)	28	(52)	261	(65)	36	(72)	48
(40)	20	(52)	294	(66)	26	(70)	37
(41)	41	(53)	420	(67)	36	(71)	52
(40)	36	(54)	602	(62)	45	(70)	27
(41)	17	(50)	212	(63)	20	(71)	10

of piles.

						2nd class Ties Posts	
						Miscellaneous	Miscellaneous
No. Pieces	Linear Feet	Grand Totals	Railroad Ties				
2447	29262	Total this page	2097	195	231		
2020	21244	Brought forward	3147	264	416		
4467	50506	Total since last report	5244	459	647		
10564	162218	Reported to Dec. 1 '13	25230	1824	1527		
15031	212724	Total to Jan. 1 '14	30474	2283	2174		

2772

154 2097 195 231

DOUGLAS FIR LOG GRADING RULES OF THE PUGET SOUND LOG SCALING AND GRADING BUREAU.

No. 1 Logs.

No. 1 logs shall be logs in the lengths of 16 to 32 feet and 30 inches in diameter inside the bark at the small end and logs 34 to 40 feet, 28 inches in diameter inside the bark at the small end and shall be logs which in the judgment of the scaler shall contain at least 50 per cent of the scaled contents in lumber in the grades of No. 2 clear and better.

No. 2 Logs.

No. 2 logs shall be not less than 16 feet long and having defects which prevent its grading No. 1, but which in the judgment of the scaler will be suitable for the manufacture of lumber principally in the grades of merchantable and better. (Further definition suggested by Forest Service: No. 2 logs shall contain 75 per cent No. 1 common and better, one-third of which 75 per cent must be No. 2 clear and better.)

No. 3 Logs.

No. 3 logs shall be not less than 16 feet long and having defects which prevent its cutting into higher grades and in the judgment of the scaler will be suitable for the manufacture of common lumber.

Cull Logs.

Cull logs shall be any logs which in the judgment of the scaler will not cut 33⅓ per cent of sound lumber.

DOUGLAS FIR LOG GRADING RULES OF THE COLUMBIA RIVER LOG SCALING AND GRADING BUREAU.

No. 1 Logs.

No. 1 logs shall be 30 inches or over in diameter inside the bark at the small end, reasonably straight-grained, and not less than 16 feet long and shall be logs which in the judgment of the scaler will contain at least 50 per cent of their scaled contents in lumber in the grades of No. 1 and No. 2 clear lumber.

In a general way it may be said that a pitch ring is not a serious grade defect in a No. 1 log, provided its location and size does not prevent the log cutting the requisite amount of clears. The same applies to rot.

Pitch pockets, seams, knots, etc., are defects which impair the grade in proportion to their effect on the amount of clears the log contains. A No. 1 log will admit a few small knots, but must be surface clear for at least four-fifths its length; a few pitch pockets, as permitted in the grades of clear lumber, but no combination of defects which will prevent the required percentage of clears.

No. 2 Logs.

No. 2 logs shall be 16 inches or over in diameter inside the bark at the small end, not less than 16 feet long, and having defects which prevent its grading No. 1, but which will in the judgment of the scaler be suitable for the manufacture of lumber principally in grades of merchantable and better.

No. 3 Logs.

No. 3 logs shall be 12 inches or over in diameter inside the bark at the small end, not less than 16 feet long, having defects which prevent its grading No. 2, and shall in the judgment of the scaler be suitable for the manufacture of inferior grades of lumber.

Cull Logs.

Cull logs shall be any logs which do not contain 50 per cent of sound lumber. All logs to be scaled by the Spalding rule.

BOUND

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U.S.Forest service

Instructions for the scaling & measurement of national forest timber.